Nova Scotia Department of
LANDS and FORESTS

ANNUAL REPORT
for the year ended march 31 1983

REPORT OF THE MINISTER OF LANDS AND FORESTS

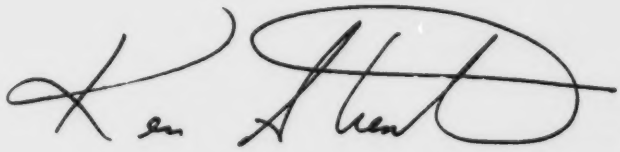
To His Honour

The Honourable Alan R. Abraham, C.D.
Lieutenant-Governor of Nova Scotia

May It Please Your Honour:

I have the honour to submit herewith the report of the Department of Lands and Forests for the fiscal year ended March 31, 1983.

Respectfully submitted,



Ken Streatch
MINISTER OF LANDS AND FORESTS

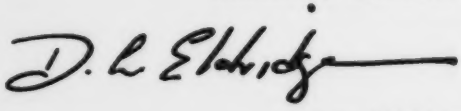
REPORT OF THE
DEPARTMENT OF LANDS AND FORESTS

The Honourable Ken Streatch
Minister of Lands and Forests
Halifax, Nova Scotia

Sir:

I have the honour of presenting the Report of the Department of Lands and Forests for the fiscal year ended March 31, 1983.

Respectfully submitted,



D.L. Eldridge
DEPUTY MINISTER

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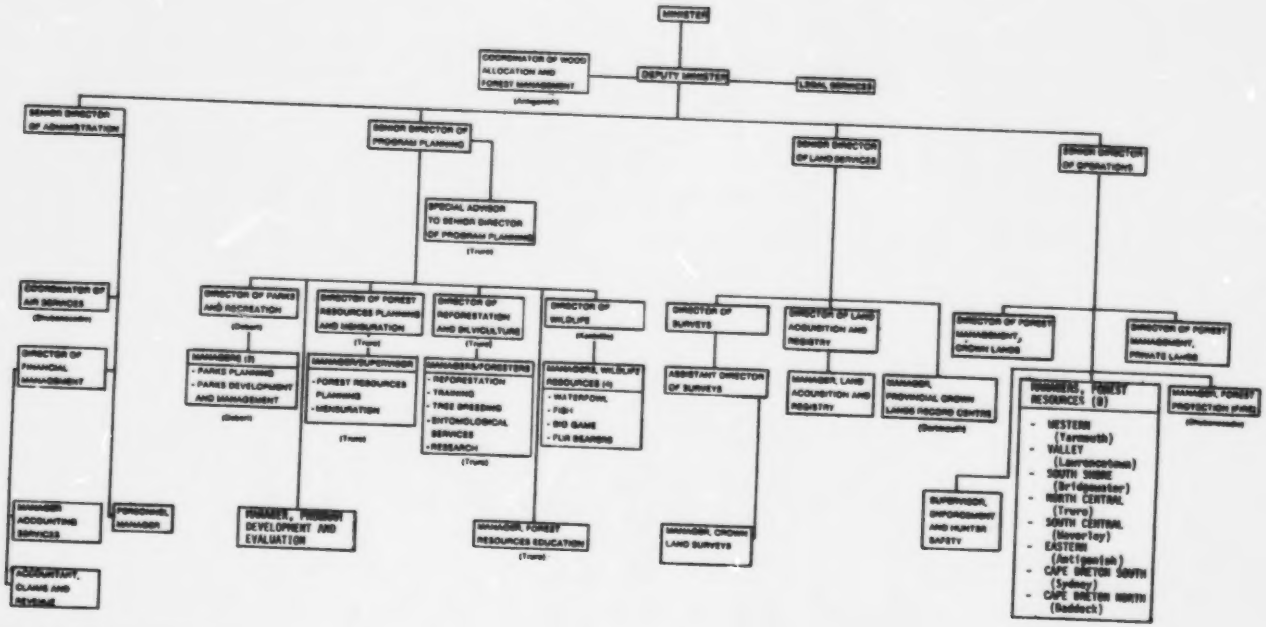
MANAGEMENT ORGANIZATION

DEPARTMENT OF LANDS AND FORESTS

PROVINCE OF NOVA SCOTIA



Note: All positions located in Halifax unless otherwise shown

DEPARTMENT OF LANDS AND FORESTS
P.O. Box 698
Halifax, Nova Scotia

MINISTER
Hon. Ken Streatch
424-4037

DEPUTY MINISTER
D.L. Eldridge
424-4121

DEPARTMENTAL FUNCTION AND ORGANIZATION

The Department of Lands and Forests was established by legislation enacted in 1926. It is charged with administering the Lands and Forests Act and various other statutes, including the Beaches Preservation and Protection Act, the Land Titles Clarification Act, and the Provincial Parks Act.

From these Acts it derives authority to manage Crown lands, to provide a system of parks, and to protect the forests, wildlife, and beaches. Inherent in the legislation and incumbent upon the department are responsibilities pertaining to the productivity of the forests generally, the implementation of forest management programs, the supply of forest products, public education, and the enhancement of recreational and scenic values. The department also assists federal agencies in enforcing the Migratory Birds Convention Act.

The functions and activities of the department are carried out through four branches: Administration, Operations, Program Planning, and Land Services. This structure is shown in Figure 1. Unless otherwise indicated, functions are located in Halifax (P.O. Box 698, Halifax, Nova Scotia B3J 2T9). The department is well decentralized with staff and facilities located in all municipalities (Figure 2).

BOARDS, COMMISSIONS, AND AGENCIES

NOVA SCOTIA FOREST PRACTICES IMPROVEMENT BOARD
Suite 210
Queen Square
45 Alderney Drive
Dartmouth, N.S.
(424-5443)

This board administers the Forest Improvement Act, which includes carry-

FIG. 2

NOVA SCOTIA DEPT. OF LANDS AND FORESTS FACILITIES 1983

— SUBDIVISIONS —

1. Eastern - Pictou, Antigonish, Guysborough
2. North Central - Cumberland, Colchester
3. South Central - Halifax, Hants
4. Valley - Kings, Annapolis
5. South Shore - Lunenburg, Queens
6. Western - Yarmouth, Digby, Shelburne
7. C.B. South - Richmond, Cape Breton
8. C.B. North - Victoria, Inverness

LEGEND

- SUBDIVISION OFFICES
- DISTRICT OFFICES
- DEPOT
- OTHER FACILITIES
  - DEBERT - PARKS DIVISION
    - TREE BREEDING
  - KENTVILLE - WILDLIFE DIVISION
  - LAWRENCETOWN
  - WITTENBURG — FOREST NURSERIES
  - STRATHLORNE
  - SHUBENACADIE - FIRE CONTROL HEADQUARTERS
    - RADIO CONTROL HEADQUARTERS
    - MECHANICAL DEPOT
    - AIR SERVICE
  - TRURO - PLANNING, MENSURATION, REFORESTATION, SILVICULTURE
  - HALIFAX - HEAD OFFICE

ing out programs of education for good forest practice, recommending cutting practices, and generally using its authority to encourage better forest management practices.

NOVA SCOTIA PULPWOOD MARKETING BOARD

Suite 210
Queen Square
45 Alderney Drive
Dartmouth, N.S.
(424-7598)

This board is responsible for administering the Pulpwood Marketing Act. The purpose is to regulate the marketing of pulpwood on behalf of producers and buyers in the province.

ROYAL COMMISSION ON FORESTRY

A three-man commission to inquire into the forest industry in Nova Scotia was appointed on May 6, 1982. It comprised Mr. Justice Nathan Green of Halifax (Chairman), Rev. Greg MacKinnon of Antigonish, and Dr. John Connor of Wolfville.

The royal commission will look into forest inventory, the quantity, quality, distribution, and value of the resource, and the sustainable harvest levels for forestry products required for current and future demand.

It will make recommendations regarding forest management techniques, including protection and utilization of the resource for maximum future benefits to the province.

As well, the royal commission will look into the impact of land ownership, competing uses, and management practices on the future supply of forest products, on fish and wildlife populations, and on recreational opportunities for Nova Scotians.

The commission has also been directed to look into the role of government in managing and using the resources of the forest. Among the subjects that will be studied are taxation and the most appropriate regulatory framework to benefit both the forest industry and the people of Nova Scotia.

Following to the death of Mr. Justice Green in October, 1982, Dr. Connor was named Chairman and Judge Lewis Matheson of Sydney was added to the commission.

From August 19, 1982 to March 31, 1983 a total of 112 presentations were made during 23 public hearings at locations throughout the province. The commissioners also made a number of field trips to see forestry operations and facilities.

ACTS ADMINISTERED BY THE DEPARTMENT OF LANDS AND FORESTS

1. Beaches and Foreshores Act
2. Beaches Preservation and Protection Act
3. Blueberry Associations Act
4. Bowaters Mersey Agreement Act
5. Forest Improvement Act
6. Indian Lands Act
7. Kedgemakooge National Park Act
8. Land Holdings Disclosure Act
9. Land Titles Clarification Act
10. Lands and Forests Act
11. Nova Scotia Pulp Limited Agreement Act
12. Parks Development Act
13. Provincial Parks Act
14. Pulpwood Marketing Act
15. Scalers Act
16. Scott Maritimes Pulp Limited Agreement Act, 1965
17. Surveys Act (not proclaimed)
18. Trails Act (not proclaimed)

ADMINISTRATION BRANCH

424-6694

The Administration Branch is responsible for financial management, personnel, administration, and air services, as well as for implementing administrative policies and procedures on behalf of the deputy minister and minister.

It is composed of three divisions: Financial Management, Personnel Administration, and Air Services.

FINANCIAL MANAGEMENT

The Financial Management Division develops financial systems and procedures and provides financial information to all branches of the department and control agencies of government. They assist in the preparation of the departmental expenditure estimates and prepare the revenue budget. They also manage and process departmental accounts payable, administer the collection of revenue, and are responsible for the distribution and sale of game and fishing licenses.

EXPENDITURES AND REVENUES
1982-83

ORDINARY EXPENDITURES

Administration Branch

Office of Minister and Deputy	$ 273,417	
Administrative Service	86,833	
Financial Management	610,226	
Game Licenses	170,828	
Personnel and Payroll	138,791	
Legal Services	66,055	
Air Services	945,101	
Grants and Assistance	242,759	
Forest Operators Assistance	875,000	
Forest Practices Improvement Board	46,835	$3,455,845

Program Planning Branch

Administration		
Branch Administration	$ 132,958	

Forest Industry and Product Development	36,313	
Urban Forestry	25,773	
Education and Information	310,546	
Reforestation and Silviculture		
Forest Nurseries	1,305,703	
Forest Resource Planning and Mensuration		
Mensuration and Office Services	197,362	
Resource Management Planning and Coordination	259,334	
Timber Loan Board	25,648	
Scaling	35,931	
Wildlife Management		
Wildlife Management Planning	478,905	
Inland Fisheries	197,405	
Wildlife Parks	477,108	$3,482,986
Operations Branch		
Administration		
Branch Administration	$ 413,691	
Silviculture Agreements	136,061	
Job Creation Programs	560,263	
Field Services		
Field Administrations	1,910,029	
Forest Protection	1,740,012	
Enforcement and Hunter Safety	502,419	
Parks Maintenance and Operation	1,092,690	
Extension and Training	54,256	
Private Land Forest Management	916,407	
Wildlife Management	368,573	
Crown Land Forest Management	1,920,012	
Properties, Vehicles, and Equipment	776,493	
Provincial Depot		
Administration	149,246	
Fire Control	542,883	
Mechanical Equipment	465,618	
Support Services	220,445	
Radio Communications	772,277	$12,541,375

Land Services Branch

Administration	61,855	
Provincial Crown Lands Record Centre	219,267	281,122
Total		$19,761,328
Forestry Subsidiary Agreement [1]		482,881
Forest Resource Development Agreement [1]		1,180,529
Royal Commission on Forestry [2]		151,633
TOTAL		$21,576,371

Ordinary Recovery Detail		
Job Creation Program	$ 345,260	
Education and Information	5,233	$ 350,493

1. Funds budgeted in the Department of Development.
2. Funds budgeted under Public Service.

CAPITAL EXPENDITURE

Furniture and Equipment

Office Furniture and Equipment	$ 17,607	
Firefighting Equipment	152,286	
Forestry Equipment	2,639,785	$ 2,809,678

Other

Parks and Recreation	1,153,920	
Reforestation and Silviculture	1,007,394	
Insects and Pathogens Protection Program	766,882	
Operational Silviculture	277,447	
Forest Resource Planning and Mensuration	628,165	
Crown Lands Access Roads	462,081	
Land Acquisition and Registry	1,118,145	
Surveys	2,195,541	7,609,575
Forestry Subsidiary Agreement [1]		97,294
Forest Resource Development Agreement [1]		193,960
Total		$10,710,507

[1] Funds Budgeted in the Department of Development

Capital Recovery Detail		
Furniture and Equipment		
Forestry Equipment	641,370	
Other		
Insects Pathogens Protection Program	109,454	$ 750,824

REVENUE

Miscellaneous	$ 165,416	
Nursery Sale of Trees	475,714	
Fines and Forfeitures	101,661	
Selective Cutting	970,378	
Timber and Fuelwood Licenses	1,971,310	
Leases and Grants	23,875	
Game and Fishing Licenses	1,753,928	
Admission Fees — Campgrounds	279,540	$5,741,822

PERSONNEL ADMINISTRATION

The Personnel Administration Division is responsible for personnel and payroll documentation, recruitment and selection, staff training and development, administration of casual rates of pay, employee counselling and grievances, and other personnel matters.

The number of civil service positions decreased slightly over the year through attrition. During the year, between 165 and 560 long-term and short-term and casual employees were on strength, depending on the time of year, to assist in full-time programs of the department, to staff regular seasonal programs, or to participate in job creation programs.

The year saw the retirement of John Ward, Supervisor, Audio-Visual Aids, at Truro; Elroy McCallum, Supervisor, Land Evaluation, at Truro; William Cock, maintenance worker, at Debert; Edward Turner, Sanctuary Warden, at Shelburne; and Leslie Corkum, Supervisor, Forest Resources, at Windsor.

AIR SERVICES

The Air Services Division is maintained by the department for forest-fire detection and suppression, resource development and management, aerial support in emergency situations, and transportation.

The fleet consists of four helicopters and three fixed-wing aircraft. All of the helicopters and one fixed-wing aircraft are equipped for water bombing.

On July 18, 1982, one of the department's helicopters (Bell 206B) was extensively damaged while fighting a forest fire near Truro. In March of 1983 this helicopter was replaced with a Hughes 500D.

During the year the department's helicopters flew a total of 255 hours on fire patrol and water bombing missions.

The Air Services was called on by Emergency Measures Organization to carry out 40 searches for missing persons. In some cases persons suffering from hypothermia or injuries were transported directly to hospitals for immediate attention.

The department's Air Services also assists in policing game violations and other related work.

WOOD SALVAGE/STORAGE AGREEMENT

During the period of this report the department sold 77,649 cords (281 444 m^3 [stacked]) of rough, budworm-killed, softwood pulpwood, previously stored at roadside on the Cape Breton Highlands, to Nova Scotia Forest Industries for use in its mill.

As of March 31, 1983 there were 239,301 cords (867 362 m^3 [stacked]) still stored at roadside on the Highlands. Approximately 30 per cent of the pulpwood still in storage has been debarked.

The department co-operated with Canadian Forestry Service and Nova Scotia Forest Industries in assessing deterioration rates for both stored and standing wood damaged by spruce budworm.

SPECIAL JOB CREATION PROGRAMS

The province again this year, in an effort to alleviate the high unemployment problem in some areas, undertook both summer and winter job creation programs. Projects included park maintenance, boundary line resurveys, park development, environmental clean-up, fuelwood culling, and silviculture. Some 70 jobs were created during the summer with an additional 225 jobs created during the winter program.

In 1982 the province also entered into an agreement with Employment and Immigration Canada and the Canadian Forestry Service to encourage persons presently drawing unemployment insurance to return to the workforce. Under this program, 379 persons were employed on various forestry-related projects throughout the province.

PROGRAM PLANNING BRANCH

424-4103

The Program Planning Branch is responsible for developing, evaluating, and recommending policy and program alternatives in forest management, park development, wildlife management, and forest industry development. The branch is also responsible for the implementation of support programs, including forest nurseries, forest research, silviculture training, education and public information, wildlife parks, aerial insect protection programs, and entomological services.

This branch is comprised of four divisions and two subdivisions. The divisions are: Reforestation and Silviculture, Forest Resources Planning and Mensuration; Wildlife; and Parks and Recreation, located in Truro, Kentville, and Debert respectively. The Forest Resources Education subdivision is located in Truro, and the Forest Industry Development subdivision is in Halifax. Direction in each case is provided from the Halifax Head Office.

Reforestation and Silviculture Division. The Reforestation and Silviculture Division, P.O. Box 68, Truro, N.S. B2N 5B8 (895-1591), is responsible for planning and directing department programs which effectively increase and improve forest yields within the province. This includes tree breeding, forest nurseries, silviculture training, forest research, entomology, and aerial insect protection programs.

The Tree Breeding Centre (662-3300) is situated at Debert, and the forest nurseries are in the following locations:

Provincial Forest Nursery
P.O. Box 130
Lawrencetown, Anna. Co., N.S.
B0S 1M0
584-2234

Strathlorne Forest Nursery
P.O. Box 489
Inverness, N.S.
B0E 1N0
258-2626

Wittenburg Forest Nursery
P.O. Box 250
Stewiacke, Col. Co., N.S.
B0N 2J0

Forest Resources Planning and Mensuration Division. The Forest Resources Planning and Mensuration Division, P.O. Box 68, Truro, N.S. B2N 5B8 (895-1591), is charged with maintaining a continuing forest inventory of all lands, land evaluation, scaling functions, and carrying out forest resources planning, which includes Crown land management planning, economic planning and roads engineering.

Wildlife Division. The Wildlife Division, P.O. Box 516, Kentville, N.S. B4N 3X3 (678-8921), is charged with appraising and evaluating the status and population trends of wildlife and inland fish species and with recommending harvest programs. The division also operates wildlife parks at Shubenacadie (Colchester County), Upper Clements (Annapolis County), and Two Rivers (Cape Breton County), and a fish-rearing station at Kelly Lake (Halifax County).

Parks and Recreation Division. The Parks and Recreation Division, RR#1, Belmont, N.S. B0M 1C0 (Debert) (662-3030), is responsible for conducting studies and preparing plans for the orderly development of a provincial parks and trails system as well as the construction program.

Forest Resources Education Subdivision. The Forest Resources Education Subdivision, P.O. Box 68, Truro, N.S. B2N 5B8 (895-1591), is responsible for a comprehensive education and technical information program for the general public and the department staff.

Forest Industry Development Subdivision. The Forest Industry Development Subdivision, (424-7708) identifies, investigates, and analyses development opportunities for wood-using industries within the province; advises on related support programs; and provides technical advisory service to the sawn-products sector.

FEDERAL/PROVINCIAL AGREEMENTS

THE CANADA/NOVA SCOTIA FOREST RESOURCE DEVELOPMENT AGREEMENT

On August 31, 1982, the federal and provincial governments signed a five-year, $53.4-million Forest Resource Development Agreement. The agreement

is designed to maintain a forest management program that can sustain the annual softwood harvest at its current level (1.5 million cords or 3 300 000 m^3).

The federal government, through the Canadian Forestry Service, will provide $27.8 million for forest renewal on private lands and will pay for half of the $1.1-million education, information, and evaluation program. The emphasis will be on small- and medium-size woodlots.

The Nova Scotia government has committed $21 million for forest renewal on Crown lands, $3 million for the operation of group ventures, $500,000 for forest industry development, and $550,000 for the education, information, and evaluation program.

These incentives are expected to stimulate an investment of some $22 million by the private sector to ensure future supplies of the province's valuable forest products.

As well as encouraging and supporting forest management to increase the sustainable supply of softwoods, the agreement has a secondary objective—to improve and increase the utilization of the forest to enhance future forest industry development opportunities.

The latter objective will include the further development of the hardwood resource, enhancement of Christmas tree production, and continued support for organizations to facilitate improved management of small private holdings.

All programs under the agreement cover the five-year period from April 1, 1982 to March 31, 1987. While the Subsidiary Agreement for Forestry expired on March 31, 1982, expenditures under this agreement were made until March 31, 1983.

THE CANADA/NOVA SCOTIA MEMORANDUM OF UNDERSTANDING CONCERNING THE CO-ORDINATION OF FOREST RESEARCH

The federal and provincial governments signed an agreement on August 31, 1982 aimed at ensuring the fullest and most efficient use of the forest research resources of Environment Canada's Canadian Forestry Service (CFS) and the Department of Lands and Forests. Entitled the "Canada/Nova Scotia Memorandum of Understanding Concerning the Co-ordination of Forest Research," the agreement clarifies the areas of research in which each agency will take a lead role.

The CFS will focus on forest protection research to address major problems in fire, insects, and disease. Other areas include tree improvement research, studies into basic problems of plantation establishment and productivity, tree nutrition and acid rain research, and evaluation of biological control measures for pest problems.

The CFS will see that technology and information developed in their research programs—particularly regarding nurseries, plantations, and small woodlot management—are transferred to the province's forest managers.

Lands and Forests, meanwhile, will address itself to short-term research to develop specific recommendations for reforestation, vegetation management, and silvicultural and harvesting methods aimed at promoting natural regeneration. It will continue to develop computer models (growth and yield) to predict effects of silviculture and other factors on the allowable annual cut, and it will evaluate mapping and photographic technologies for gathering and analysing forest data.

ADMINISTRATION

FOREST RESOURCES EDUCATION SUBDIVISION

The Forest Resources Education Subdivision provides a central education and information service to staff and public. This is carried out through an inquiries desk, literature, a motion picture program and audio-visual library, production of exhibits, posters, and signs, special advertising, courses, walks, and talks. The service complements and supports the extensive public information function performed by all staff.

Full-time staff consists of one forester, one wildlife biologist, one technical writer, one field representative, and two clerks.

Public demand for information on all aspects of forest resources is generally increasing.

During the year subdivision staff answered 1,532 written requests (as distinct from some several thousand requests related to the two periodicals). Subscriptions to the quarterly magazine *N.S. Conservation* rose from 18,306 in March 1982 to 21,478 in March 1983. With the help of strong public support, a threatened cancellation of the magazine for budgetary reasons was successfully averted. To meet new Canada Post regulations, the mailing list computer program was completely revised.

Following its second subscription renewal, the list for the bimonthly newsletter *Forest Times* increased from 7,391 to 8,022. It was funded under carry-over funds from the Subsidiary Agreement for Forestry.

The major new publication was the department's submission to the Royal Commission on Forestry, a 331-page document with over 50 charts and graphs. The manager assisted with layout, editing, and proofing, and the subdivision arranged production and distribution.

More than a thousand copies of *Cone Critters and Other Forest Crafts,* a new illustrated handcraft guide for teachers and youth leaders, were distributed. The new edition of the children's story *The Man Who Couldn't Stop Sneezing* was distributed to public libraries, day-care centres, children's hospital wards, and elementary schools. Liaison continued with Ralph Johnson on the writing of a forest history, a project being assisted under the forestry subsidiary agreement; publication is planned for 1985. A revised edition of the popular booklet **Growing Your Own Trees** was printed, and several reprints of other forestry booklets were arranged.

A new coloring sheet for elementary school children was prepared and distributed. Work began on a new forestry directory, for publication in the fall of 1983.

Wildlife publications included one issue of *Trappers Newletter,* revised hunting, fishing, and trapping regulations in season, and two new publications lists. A salmon life-cycle handout was prepared for the Margaree Salmon Museum.

Monitoring of distribution of **The Trees Around Us** shows that as of March 31, 1983 some 2,500 copies remained in storage at Shubenacadie, out of a total of 20,000. Demand from the public and from field offices is slow but steady.

Audio-Visual

Owing to the loss of the audio-visual supervisor position it was necessary to curtail film lending for two months. Film and slide loans during the year totalled approximately a thousand; there were also several hundred equipment loans.

The motion picture program in the schools was continued through F.R.E. and Operations staff, who put on 807 showings to elementary school audiences totalling 73,933 individuals. They also carried out 108 request showings for youth and adult groups totalling 2,937 persons. Total showings were

down 12 per cent from 1980-81, mainly due to pressure on staff from other duties.

Rough editing of the bald eagle film was completed by the Department of Government Services film unit; the film should be ready for use by September 1983.

With the Silviculture section, work was completed on the 16-mm silent training film "Organized Cutting—Bench Method," and it was field tested. In June, filming and still photography of the aerial Bt spraying operation was all but completed, and a bobcat tracking experiment was also documented.

The entire 16-mm library was culled, and 27 prints were removed because of age or condition. Eight new 16-mm prints were bought, and an equal number repaired. Two new slide sets were acquired, and several dozen 35-mm transparencies were added to the library.

Videotape recording of over a dozen provincially made forestry films was arranged with Media Services of the Department of Education for use in their loan service to teachers.

Meetings were held with Central Subdivision staff to develop prototype kits to assist staff during speaking engagements. Two topics, "Dogs and Deer" and "Plant Succession," are in preparation.

Considerable time was spent helping staff to prepare audio-visual presentations for the Royal Commission on Forestry hearings.

Work began on a new fire prevention television commercial featuring an animated moose. A short film sequence on Nova Scotia bald eagle was prepared and aired on CBC-TV's Sunday morning program "Switchback." The wildlife biologist made three appearances on this program during the year.

Exhibits, Posters, Signs

The theme for the fall-fair circuit was "Forests—Something for Everyone." Elements of the resultant display were transported and used in six different exhibitions: South Shore (Bridgewater), Hants County (Windsor), Halifax County (Middle Musquodoboit), Cumberland County (Oxford), Antigonish County (Antigonish), Queens County (Caledonia), and the Provincial Exhibition (Truro). As an incentive to attendance and promotion, model dories were procured and given to winners of a children's draw.

Exhibits were also set up at the Small Business Fair, Dartmouth; at Amherst Mall; at the annual meeting of the N.S. Forest Products Association (Truro); and at Milford, Whycocomagh, and Stewiacke.

Posters on the 1982 sport-fishing regulations were produced and distributed to all schools. Dog/deer information signs were produced for Yarmouth and Whycocomagh. A poster encouraging hunters to seek landowners' permission was designed for production in 1983.

During National Wildlife Week, posters and kits were mailed to all schools in the province, and 2,500 children's posters were judged. Owing to budget restraints, no Smokey Bear posters or materials were mailed. A boardroom map was developed, and a foyer exhibit maintained in Truro.

Advertising

The subdivision arranged special-message advertising through the Department of Government Services.

Two 30-second radio ads were run in April to support burning permit notices in provincial weekly newspapers. These were followed by three general fire prevention messages during the summer.

In support of Land Resources Co-ordinating Committee activities, print ads promoting choose-and-cut Christmas tree lots were placed in selected weekly newspapers.

A radio campaign against theft of forest products was again aired in the fall, with favorable comments from landowners and others.

A full-page fire prevent[illegible] ad was run in the summer issue of *Cape Breton's Magazine*.

The biologist worked with Government Services to produce a 30-second and a 60-second advertisement promoting better hunter-landowner relations.

A new crest, designed to encourage deer hunters to assist with department management programs, was produced and distributed.

Teacher Training and Curriculum Enrichment

On the principle that if our educators do not understand the purpose and methods of forestry neither will their students, the subdivision actively promotes teacher training and curriculum aids. During the year the manager

put on three one-day in-services at elementary schools in River Hebert (Cumberland County), Maitland (Hants), and North River (Colchester), reaching 38 teachers. He again co-instructed the two-week Forest Ecology (Methods) course at the Nova Scotia Teachers College summer school and gave two lectures to about 40 teachers' college students during the year. To monitor course effectiveness, he and a co-instructor visited graduates in six Annapolis Valley schools.

A special pesticides seminar was arranged in Truro for students of the Forestry 206 summer school course, featuring Ottawa representatives from the federal departments of Agriculture and Health and Welfare. A session was also arranged with the minister on department policy.

Some effort went into establishing a Forestry 206 course in Cape Breton. Despite a small attendance in 1982, the course is expected to grow. Help was provided to the Nova Scotia Museum to refurbish the forestry kits introduced in January 1981. This will be an ongoing commitment. A smaller prototype kit on using natural woodland objects in handicrafts was developed.

Walks and Talks

Although most requests for walks and talks are handled by Operations staff, the manager and wildlife biologist look after a number each year. In 1982-83 these included: Admiral Westphal School (Grades 6, 7, 8, 9) at Manganese Mines; Girl Guides (Old Barns); Boy Scouts (Truro); Settle-Inn Boys Camp (Debert); Nova Scotia Agricultural College and Nova Scotia Teacher College classes; the Order of Good Cheer (Annapolis Royal); and Sylvicon (Fredericton, N.B.). In the latter instance the manager served as a panel speaker.

Miscellaneous

A Forestry Education group (FORED), set up by the subdivision during the year, looked into various co-operative programs at the community level and initiated a few on a trial basis, including a tree-planting ceremony and an article in *Home & Country*, the official organ of the Women's Institute of Nova Scotia.

The biologist served throughout the year on the Education Subcommittee of the Land Resources Co-ordinating Committee. The manager and resource education officer toured group venture projects in the eastern and western counties. A school speaker program staffed by Canadian Institute of Forestry members was arranged, and the subdivision hosted forestry visitors from Australia. Forestry materials were sent to all weekly newspapers

during National Forest Week. A brief was drafted for the new Forest Resource Development Agreement, as well as for the Royal Commission on Forestry. Help was given to National Survival Institute with organizing spring plantings under the "For Every Child a Tree" program.

FOREST INDUSTRY DEVELOPMENT SUBDIVISION

The Forest Industry Development Subdivision in sawmilling and wood-related industry provides technical assistance to operators and a liaison service with other provincial and federal departments.

As a result of the poor economy, high interest rates, and the effects of the strike at the Scott Maritimes mill, this year has been the slowest in the history of the program.

Nonetheless, the supervisor responded to over 300 requests for assistance, providing scaled drawings for sawmill layouts, training, instruction, alignment, and various other types of technical assistance.

During the past year, the supervisor attended the Industrial Show in Moncton, N.B., researched the burning of forest biomass in Maine and P.E.I., and attended an energy seminar in Kentville given by the Department of Mines and Energy. He also toured the province with John Torunski and Don Clark, visiting the sawfilers who had previously taken the course at the Maritime Forest Ranger School.

Construction

Laurie Isenor and Sons of Halifax County lost their pallet mill to fire and have rebuilt. Stott Timber of Cape Breton ceased production.

New Sawmills

Erfan Lumber Co.	Halifax Co.	Start-up (New)
Norman Gaudet	Digby Co.	Start-up (New)
Dave Thomas and Harold Alexander	Digby Co.	Start-up (New)
McClare Brothers	Hants Co.	Start-up (New)

Modifications to Sawmills

Ledwidge Lumber Co.	Halifax Co.	Building (New)
A.F. Theriault and Sons Ltd.	Digby Co.	Finish Remodelling

Dry Kilns

Harry Freeman	Queens Co.	Start-up
Bernard Bell	Digby Co.	Start-up
Bowater Mersey	Lunenburg Co.	Start-up

Fuelwood (Processors)

Goodwood Fuel Co.	Halifax Co.	Start-up
Ledwidge Lumber Co.	Halifax Co.	Building

Shingle Mill

Brian Purdy	Queens Co.	Start-up

Lath Mill

Daniel Noah	Digby Co.	Start-up
Norman Melanson	Digby Co.	Remodelled

URBAN FORESTRY

To generate more interest in intensive management of the forest and related vegetation in the province's urban areas, a forester was assigned to contact representatives from the cities, towns, and villages to provide technical advice. This included advice on tree inventory, pruning, establishment, removal, and planting. As more communities learn about this service, more are using it.

Literature, slides, and movies are being assembled to assist in this promotional program. Plans call for a survey of the municipalities to determine tree-care needs, followed by seminars and booklets on tree care. The forester is also responsible for contacting the municipalities to determine the present level of management, sources of funding, and the needs for implementing and co-ordinating the Dutch Elm Disease Assistance program.

The Unemployment Insurance Job Creation—Forestry Sector program undertaken with the Canada Employment and Immigration Commission provided a stimulus to many municipalities for implementing a more intensive tree-care program. Six municipalities participated, carrying out woodlot improvement, street-tree sanitation, and boundary-line establishment.

It is encouraging to see several other municipalities setting up tree committees and starting tree-care projects. It is a slow process, but progress is being made.

DUTCH ELM DISEASE ASSISTANCE

History

The Dutch elm disease (D.E.D.) is caused by a fungus which was introduced to North America via Ohio in 1930 on some elm logs imported from Europe. It was first noticed in Canada at Sorel, Quebec in 1944.

In Nova Scotia it was first detected at Liverpool in 1969; it is now found in 11 counties. The fungus grows in the living cells of elms and blocks the movement of moisture, causing part or all the foliage to wilt and die. The disease is spread by native and introduced bark beetles, which breed in dead and dying tissues and then feed on healthy trees. In the spring and early summer the adults emerge from the breeding places, carrying the spores. Once a tree is infected, the fungus spreads swiftly, usually killing its host.

Control

There is no known total cure for this disease. Present methods aim at prevention and control. The first objective is to keep elms healthy, vigorous, and properly pruned. To achieve this, a sanitation program calling for the speedy removal of all dead and dying elms is considered essential. In the early stages, when infected areas are small, all infected elm limbs and trees are removed. Infected wood must be burned or buried.

In some areas insecticides and fungicides have been used as part of a total control package. But because of the high cost and the need for special equipment and trained applicators, their use is usually restricted to high-value trees.

Assistance

The Nova Scotia Department of Lands and Forests has attempted to control the spread of D.E.D. by implementing a sanitation assistance program. In the mid-seventies a three-year assistance program was initiated to provide financial help to the municipalities for sanitation work. Commencing in the 1980-81 fiscal year, the province again provided such assistance.

The current program provides 50 per cent cost-sharing to municipalities to carry out sanitation work. The money is allocated in the following order of priority: (1) municipalities with infected trees; (2) municipalities with trees in the immediate area of infected trees; and (3) other municipalities.

Nineteen municipalities participated in the program. The amount of assistance allocated to each is shown below:

Municipality	No. of Trees	$/Claim	Per Cent
Stewiacke	5	$ 364.57	2
Berwick	9	1,075.00	4
Pictou	8	1,200.00	5
Middleton	5	1,162.00	5
Truro	22	2,030.00	8
Westville	8	1,000.00	4
Bridgetown	35	2,220.00	9
Wolfville	6	730.00	3
Bridgewater	10	1,457.00	6
Annapolis Royal	9	1,120.00	4
Windsor	18	2,500.00	10
Antigonish	4	1,545.00	6
Lawrencetown	3	136.00	-
Digby	5	1,197.00	5
Oxford	5	509.88	2
Stellarton	3	400.00	2
New Glasgow	13	2,565.00	10
Halifax	27	2,500.00	10
Annapolis County	7	1,288.55	5
Total	202	$25,000.00	100

Average cost per tree (assistance)--$123.76

REFORESTATION AND SILVICULTURE DIVISION

TREE BREEDING

The Tree Breeding Section is charged with the responsibility of co-ordinating the overall Tree Improvement Working Group (TIWG) program and fulfilling the department's commitment to the project. Operational work is shared with the three industrial members: Bowater Mersey Paper Company Ltd., Nova Scotia Forest Industries, and Scott Paper International, Inc. Technical and scientific expertise is made available through the Maritimes Forest Research Centre of the Canadian Forestry Service.

Plus-Tree Selection

Approximately 325 plus-trees were selected by department and company crews in 1982. This increases the total number of trees in the base breeding popula-

tion to 1,131 selections (see Table). Priority was given to white spruce and black spruce, where total numbers of plus-trees were well below required targets. In the case of white spruce, this short-fall in previous years was due to heavy defoliation by spruce budworm and to problems with locating suitable stands. Black spruce selections had been down, chiefly owing to poor seed crops. A fairly good black spruce seed crop in 1982 permitted some additional selections. However, despite a concentrated effort, selection in white spruce remained below expectations.

Scion Collecting and Grafting

This year, with many company personnel returning for a second year, the grafting program seemed routine. Reduced survival in white spruce was again a problem as compared to the other species. The unusually mild winter may have been a factor.

Approximately 7,600 grafted seedlings from last year's program were outplanted and overwintered in transplant beds at the centre. Previous year's grafts, which were originally scheduled for lifting, were held over for another year to correct some problems in top development.

Clonal Seed Orchards

There are currently about 10 acres (40 ha) of grafted orchard established under the TIWG program. With transplanted grafted stock being held over for an additional growing season, there was no increase in clonal orchard size. This allowed additional time for planting-site preparation. Virtually all clonal seed orchard sites received considerable attention and were well prepared for the 1983 outplanting. In addition, a good deal of maintenance work such as pruning, weed control, and fertilization was carried out on previously established grafted orchards.

A limited number of control-pollinated families were initiated by department staff on white spruce in the clonal seed orchard at the Provincial Forest Nursery in Lawrencetown. The primary purpose was to familiarize staff with proper technique for large-scale test pollinations which will begin in a year or so.

Seedling Seed Orchards

Planting of the lowland black spruce orchard at East Mines was carried out in June in co-operation with Scott Paper International, Inc. This orchard currently has 225 selected families and will produce improved black spruce seed for the central and eastern mainland. Accompanying lowland family

PLUS-TREE SELECTION TO DECEMBER 31, 1982

	SELECTED JAN.-DEC. 1982*					SELECTED PRIOR TO 1982					
Species	L&F	Mersey	NSFI	Scott	Total	L&F	Mersey	NSFI	Scott	Total	Grand Total
wS	1	—	41	8	50	63	1	96	51	211	261
rS	25	25(2)	5	24	79(2)	68	129(3)	21	133(1)	351(4)	430(6)
bS	78	—	12	35	125	24	—	114	—	138	263
wP	4	—	4	1	9	34	—	2	—	36	45
jP	—	—	—	—	—	20	—	—	30	50	50
nS	62	—	—	—	62	20	—	—	—	20	82
TOTALS	170	25(2)	62	68	325(2)	229	130(3)	233	214(1)	806(4)	1,131(6)

* Figures in brackets indicate additional plus-trees not yet registered for breeding work.

tests were planted on the West Brook Road, Caledonia, Guysborough County, and at Lakeview Road, Kings County. A lowland family test to be planted in Upper Middle River, Victoria County, was postponed until spring 1983.

Planting of the highland black spruce orchard at Strathlorne was postponed until spring of 1983 as well, to allow for additional site preparation. Two family tests for this orchard were planted: one on the Park Spur Road, Inverness County, and one on Mile 14E Road, Victoria County.

All family tests will be used to evaluate the genetic value of each family used in the orchards.

Five-Year Assessment of 1978 Plantations

The five-year assessment of 1978 experimental plantations was carried out in late August, September, and early October. Both department and company personnel assessed these plantations. In all, height measurements and damage assessments were recorded for some 29,000 trees.

Analysis of the raw data from these plantations is still under way.

Genetic Improvement of Christmas Trees

Rooted cuttings of balsam fir produced as part of a pilot study to investigate the possibility of producing improved stock vegetatively from selected Christmas trees were maintained and will be outplanted next year. No additional work was possible this year; but indications are that a vegetative propagation system for selected trees may be feasible with additional refinement of nursery technique and investigation into genetic control of desirable traits.

Seed Testing and Inventory

A heavy seed crop in some areas resulted in a rather full laboratory testing schedule. A new germination test container was introduced to allow evaluation of germinant abnormalities. In addition, many new seed lots required conditioning to lower moisture contents to levels suitable for long-term frozen storage. Many deposits and withdrawals from seed storage were processed, with some balsam fir and white spruce requiring moist pre-chill treatments prior to treatment.

Several research seedlots were also processed, including 125 black spruce collections for orchard establishment and several alder *(Alnus incana)* collections for a range-wide provenance test.

The centre now has over 675 seedlots on inventory for nursery production and research purposes.

University of New Brunswick Studies

Over 2,600 wood samples collected from selected trees were analysed at the University of New Brunswick for specific gravity. These data have been combined with those collected in previous years and are currently being analysed to determine the nature of variation in natural populations and the potential for genetic improvement of wood quality.

Miscellaneous

The staff at the Tree Breeding Centre gave many tours to professional, educational, and general interest groups during the year and made presentations at special courses.

NURSERY OPERATIONS

The Lawrencetown nursery lifted 6,080,260 trees in April and May, of which 3,210,160 were shipped for outplanting and 2,870,100 were transplanted at the Lawrencetown and Eden nurseries.

In October and November a further 4.5 million trees were lifted and placed in frozen storage over winter. One million of these will be shipped for outplanting in the spring of 1983; the rest will be transplanted.

The Strathlorne nursery lifted 2,659,590 trees, of which 2,503, 290 were outplanted, 100,000 were transplanted in the Chignecto transplant nursery, and 50,000 were transplanted at Strathlorne. The remaining 6,300 were shipped to the Tree Breeding Centre for use in their grafting program.

Distribution of planting stock in 1982 was as follows:

Crown	1,036,128
Large private	3,584,634
GDA	1,374,758
Small private	295,890
Other	28,340
	6,319,750

Vegetative Propagation of Highland Black Spruce

Vegetative propagation of highland black spruce is continuing at the Strathlorne nursery. In February and March 680,000 rooted cuttings were prepared. Most of them will be used as parent-material base. A second cut in February/March 1983 is rooting well and should produce in excess of 630,000 rooted cuttings for subsequent outplanting on the Cape Breton Highlands.

Seed Procurement

In 1982, 2,198 bushels (799 hl) of cones were collected, but seed extraction was not complete at time of writing.

Species and volumes collected were as follows:

Species	Volume	
White spruce	530.75 bu.	(193 hl)
Highland white spruce	5.50 bu.	(2 hl)
Black spruce	385.00 bu.	(140 hl)
Red spruce	759.00 bu.	(276 hl)
Norway spruce	5.50 bu.	(2 hl)
Tamarack larch	11.00 bu.	(4 hl)
Balsam fir	500.50 bu.	(182 hl)
Totals	2,197.25 bu.	(799 hl)

Ninety-five percent of the cones were collected by private contractors and individuals, technically assisted by Lands and Forests personnel. In addition, we purchased 66 lb. (30 kg) of red pine seed from the Ontario Ministry of Natural Resources.

Expansion and Development

The Lawrencetown nursery erected one additional free-standing greenhouse which increased greenhouse space to 11,904 ft.^{2} (1 106 m^2) and productive capacity to 1.3 million annually.

The tree seed storage unit was moved to the new header-house and upgraded to higher standards.

With funding under the provincial winter employment program, a start

was made on clearing a five-acre (2 ha) site as a transplant area.

At the Strathlorne nursery, a second irrigation pond of 2.6 million-gallon (12 million-litre) capacity was finished. Three buildings (vehicle storage, cold storage/administration, and chemical storage) were completed, with funding shared between the Canada Department of Regional Economic Expansion and the Province of Nova Scotia under the Canada/Nova Scotia Subsidiary Agreement on Forestry.

A free-standing greenhouse erected in 1981 was winterized. Four nursery fields were brought up to full production capability.

At the Wittenburg nursery, two old, free-standing greenhouses were repaired, upgraded and brought into production. Total productive capacity is now 4.8 million annually.

Administration and Research

Nursery administration and research staff allocated available planting stock on an equitable basis; consolidated nursery budgets; co-ordinated cone crop surveys and collections; carried out research at all three nurseries; oversaw production at the Chignecto Management Unit nursery; monitored progress and provided advice and recommendations to the staff of the three main nurseries; and organized and hosted the Northeastern Area Nurserymen's Conference at Halifax and the first annual Vegetative Propagation Workshop at Strathlorne.

Training

Two staff members attended container production update in Fredericton, and three attended the Maritime Forest Nurserymen's Workshop at Bathurst.

In co-operation with staff from the Tree Breeding Centre, a course on cone collecting and tree climbing was organized for Lands and Forests staff and private individuals in the three Lands and Forests staff and private individuals in the three eastern subdivisions. The course was held near Baddeck.

Public Relations

In addition to routine answering of requests, nursery tours for technical groups and individuals, special interest groups, and the general public were conducted at all three nurseries.

ENTOMOLOGICAL SERVICES

There are 21 pest detection officers (PDOs) in the department. These people collected 463 insect and disease samples. The PDOs also did the sampling for the 1982 spruce budworm egg-mass survey.

The following is information on serious insect and pathogen pests.

Spruce budworm

Defoliation

The aerial survey of spruce budworm defoliation covered all of Cape Breton Island, Cumberland, Colchester, Pictou, Antigonish, parts of Guysborough, all of the Annapolis Valley Region, and parts of Shelburne, Queens, and Hants counties.

Defoliation was noted on 523,863 acres (212 000 ha) of spruce, fir, and mixedwood forest in 1982. Of this area, 23 per cent (121,823 acres [49 300 ha]) was severely defoliated, 59 per cent (308,881 acres [125 000 ha]) was moderately defoliated, and 17 per cent (91,182 acres [36 900 ha]) was lightly defoliated. Stands of susceptible trees in Cumberland and Colchester counties and along the Northumberland Strait sustained most of the damage (see Table V, Appendix).

Egg-mass Survey

Population densities in Cape Breton and Richmond counties have declined to a low level. But a resurgence occurred in Inverness County, in the Creignish-Kingsville-Little Judique area, and in the area from Cap LeMoine (Inverness County) north to Cape North (Victoria County).

Population densities increased in susceptible stands around Stellarton, Pictou County, and on Cape George, Antigonish County. Population densities have increased significantly in the Chignecto Peninsula, Cumberland County, and from Salem east to Tatamagouche, Colchester County. Population densities also increased significantly in the North and South Mountain regions of the Annapolis Valley. Elsewhere on the mainland, increased densities of spruce budworm egg-masses resulted from a combination of favorable weather conditions and an abundance of fir and spruce flowers, which are a highly nutritious larval food. (For details see Table VI, Appendix.)

Tree Mortality

Tree mortality of balsam fir during the current spruce budworm outbreak on Cape Breton Island has been assessed annually since 1976 on 25 permanent research plots. As of 1982, 10 years after the start of the outbreak, the proportion of dead merchantable balsam fir is 67 per cent on the highlands and 88 per cent on the lowlands. An additional 5 per cent on the highlands and 1 per cent on the lowlands has been blown down. Another 5 per cent and 1 per cent are classed as moribund. Over the past six years an average of 10 per cent of the merchantable balsam fir died annually in the highlands and 13 per cent on the lowlands.

During the last two years, trees have been dying at a faster rate, even though the spruce budworm populations are lower. On the highlands 27 per cent of the fir living in 1981 died. Two years ago only 17 per cent of the living fir died. On the lowlands the 1982 rate was 67 per cent as compared to 28 per cent in 1980. Of the remaining merchantable balsam fir on the highlands and lowlands, 76 per cent and 81 per cent respectively are in the 50-75 per cent total defoliation class, with 19 per cent and 6 per cent moribund.

Gypsy Moth

Gypsy moth severely defoliated hardwoods on over 7.9 million acres (3.2 million ha) in the eastern half of the United States and caused discomfort, inconvenience, and financial burden to people in many areas in 1982. In the fall of 1981 at Yarmouth, egg-masses of the insect were found in Nova Scotia for the first time. No larvae were seen in the town in the summer 1982 in the few blocks where a control program, involving ground application of the biocide Btk *(Bacillus thuringiensis kurstaki)* and implantation of a systemic chemical, was carried out in May. However, this year's search, a co-ordinated multi-agency effort, has already located egg-masses at two locations in southwestern Nova Scotia. More than 50 egg-masses were found in Yarmouth and several more at Church Point, Digby County. Although gypsy moth is a rather indiscriminate feeder, its favorite host is oak, on which populations can build up rapidly. Oak stands are numerous in the western half of the province and the proximity of the known gypsy moth infestations to these stands is of considerable concern.

Spruce Beetle

Spruce beetle has killed more than 9 per cent of the province's total white spruce since the mid 1960s, when its populations built up following extensive storm damage. Although losses are most extensive on Cape Breton Island

and in the northwestern part of the province, damage is widespread throughout Nova Scotia. In 1982 beetle attack has intensified, resulting in further increase in mortality.

Eastern Larch Beetle

Eastern larch beetle has killed over 60 per cent of merchantable-size larch since 1978 and has also successfully attacked and killed smaller trees. There are some early indications that the outbreak, probably triggered by the weakening of mature trees by larch sawfly in the 1970s, may have peaked. However, tree mortality is expected to continue throughout the province for a number of years.

Forest Tent Caterpillar

Populations increased again in 1982. Although defoliation occurred only in small areas, these pockets were more numerous than last year's, indicating an impending outbreak.

European Larch Canker

This disease is widespread throughout much of mainland Nova Scotia. Recently rediscovered in North America after an absence of several decades, it also occurs in southern New Brunswick and eastern Maine. To date the disease, which causes extensive branch dieback and mortality in younger trees, has been found only on native larch. However, in Europe it has forced the exclusion of larch from plantation programs in many areas. Tree improvement programs, within the framework of increased emphasis on forest renewal, often rely on larch hybrids for wood production. The presence of this disease could seriously hamper the effort.

Dutch Elm Disease

Within its known range Dutch elm disease continued to intensify, especially in Cumberland, north Colchester, and Pictou counties. It also spread to new areas. The most extensive spread in 1982 occurred in Pictou and Antigonish counties. The range was further extended in the Annapolis Valley with the discovery of the disease in Middleton. The first infected trees were found in the City of Halifax and in the Town of Truro. About 18 per cent of the Nova Scotia's rural elm trees have been killed or infected by the disease, but the concentration of dead and dying trees is highest in the north and north-central part, where more than half the trees are affected.

Douglas-Fir Needle Cast

There are two species of fungi, *Rhabdocline pseudotsugae* and *R. werii,* that cause Douglas-fir needle cast. Susceptible phenotypes in Christmas tree plantations have been attacked in Nova Scotia. Growing Douglas-fir for Christmas trees in Nova Scotia should therefore be discouraged.

FOLIAGE PROTECTION PROGRAM

An operational foliage protection program was carried out against spruce budworm in 1982. The object of the program was to maintain 50 per cent or more of current foliage.

Areas

The low population densities of spruce budworm larvae in Cape Breton did not warrant foliage protection on previously treated areas, but trees in the cone production areas were treated. The spruce budworm infestation intensified in Cumberland County, and additional areas were added to the program. The total area flown was 47,328 acres (19 153 ha)—1,554 acres (629 ha) in Cape Breton and 45,774 acres (18,524 ha) on the mainland.

Biocide

The biocide used was a species of bacteria Btk *(Bacillus thuringiensis kurstaki)* applied at a concentration of 20 billion International Units per hectare. Three commercial formulations were applied—Dipel 88, Thuricide 16B, and Thuricide 32LV.

The following table shows the rates and total volume of three commercial preparations of Btk *(Bacillus thuringiensis kurstaki)* used to protect current foliage of spruce *(Picea* spp.) and balsam fir *(Abies balsamea)* from feeding by larvae of spruce budworm *(Choristoneura fumiferana* [Clemens, 1865]) in selected areas of Nova Scotia in 1982.

Commercial Preparation	Formulation			Total Volume (drums)	
	Concentration	Water	Total		
Trade Name	1	1	1	1	202.5 1
Thuricide 16B [1]	4.70	2.30	7.10	5 467.5	27
Dipel 88 [2]	2.35	2.50	5.85	1 012.5	5
Thuricide 32LV [1]	2.35	2.50	5.85	32 400.0	160

1. Sandoz Inc. 480 Camino Del Rio South, San Diego, Cal. U.S.A. 92108
2. Abbott Lab. Ltée, C.P. 6150, Stn. A., Montreal, CUM, Qué. H3C 3K6

For further information about this biocide program, see Table VII, Appendix.

Aircraft

Nine Grumman Ag Cat spray aircraft and five guidance aircraft were stationed at Parrsboro. The cone production areas in Cape Breton were treated by helicopter.

Host Conditions

This year spruce and fir trees produced an abundance of flowers. Flowers, a high protein source, are the preferred food of spruce budworm larvae. Feeding was confined to the flowers when they were available. This tended to reduce the feeding pressure on the current foliage, and with the dry weather, enhanced the survival of larval and later life stages.

Results

On the mainland the percentage of current red spruce foliage protected ranged from 23 in Welton to 57 in Moose River. The larval populations varied from 10 to 33 larvae per 45-cm branch tip, pupal survival ranged from 0.3 to 4.4, and the reduction in survival ranged from 40 to 63 per cent.

Data for larvae mortality and foliage protection should be treated with caution and are not comparable to 1981 data. The abundance of flowers enhanced larvae survival and reduced feeding on the foliage in both the treated and untreated areas.

Expenditures

The total expenditures of the Btk program from 30 September, 1981 to 30 September, 1982 was $749,229.61. The cost per acre flown was $15.83 per cent ($39.12 per hectare). For details, see Table VIII, Appendix.

SILVICULTURE TRAINING

Chainsaw Instructor's Course

Continuing the department's objective to train selected staff as chainsaw instructors, five-day courses were given for the Western, Valley, South Shore and Cape Breton subdivisions, thereby completing the program begun in 1981-82. In all, 55 staff have received instructor training in proper maintenance and good, safe, productive working techniques. All have been

supplied with lesson plans and training aids to enable them to instruct other staff, woodlot owners, and silviculture crews.

Woodlot Management Courses

Again, during the fall semester, the subdivision gave the Farm Woodlot Management course to students taking the Technician program at the Nova Scotia Agricultural College in Truro. Nine students enrolled in the course. Also in Truro a week-long course was given to farm woodlot owners in proper management practices and in chainsaw maintenance and safe use.

For a summary of courses given, see the following table.

SILVICULTURE AND RELATED COURSES (1982-83)

Course Title	Location	No. Trainees
Farm Woodlot Management	N.S.A.C.	9
Basic Christmas Tree Production	Scotsburn	80
Chainsaw Instructors	East Kempville, Coxheath, and Wiles Lake	32
Chainsaw Use and Maintenance	Tatamagouche	5
Farm Woodlot Management and Chainsaw Safety	Truro	10

Manuals and Training Aids

Part 3 of a chainsaw instructors manual from Scotland was amended for local conditions. These lesson plans, together with the training aids developed, including flip charts and overhead transparencies, make a complete instructor's package.

The subdivision, together with Forest Resources Education, produced a 12-minute silent training film entitled "Organized Felling for Shortwood—Bench Method." A three-dimensional model illustrating the bench method of organized felling was produced and displayed on training courses and at the Nova Scotia Forest Products Association's 49th Annual Meeting.

In addition to supplying our own department instructors, Silviculture Training has sold training aids to forest industries and the government of Prince Edward Island. The illustrated flip chart entitled "Aids to Planting Instruction" was updated to include multipot and shovel planting techniques.

A five-minute slide-tape show entitled "Shelterwood Harvesting" was drafted and slides were obtained. It gives guidelines on harvesting mature stands of such species as red spruce or yellow birch, in a series of cuts, to promote regeneration. The slide set will be distributed to each subdivision.

Subdivision personnel also designed a method of cataloguing slides and photographs for easy access when preparing for lectures or other presentations. Aerial photographs were taken to assist in reforestation planning.

Other Activities

Subdivision personnel actively represent the department on the Nova Scotia Forest Products Association Safety and Training Committee. A major objective of this committee is to have skilled silviculture workers recognized as professionals. Efforts continue to have a three-phase professional forest worker training program implemented at Commercial Safety College at Masstown.

FOREST RESEARCH

Experimental Reforestation Trials

The importance of the provincial reforestation program is reflected in the scope of the department's plantation establishment and management research program. Since the inception of the program in 1973, over 250 acres (100 ha) of experimental plantations have been planted. This research is designed to determine, for the major sites, the species, stock age, type and quality, season, fertilizer regime, and site-preparation method required to maximize seedling survival and growth and to minimize costs.

Herbicide Trials

Many newly established conifer plantations are seriously threatened by weed species. Prescriptions for the most effective herbicide for use against various weed species, including time of application and volume of solution, are derived from ongoing research.

No new trials were established this year, but previously established experiments were remeasured. Experiments have been established at over 15 locations throughout the province to test the effectiveness of the newer herbicides.

Growth and Yield Models

Two vital components of modern forest management are growth and yield computer models capable of quickly and reliably predicting the effect of varying types and levels of silviculture and/or insect and disease damage on growth and yield, and on the allowable annual cut. Refinement of such models is continuing, based on data from permanent sample plots (PSPs) and from temporary sample plots (TSPs) of the provincial forest inventory.

Mechanical Silviculture Equipment Trails

To help minimize the costs of silviculture operations, the department is evaluating silviculture equipment. This research, jointly funded with industry, is designed to develop prescriptions including the best machine(s) for each of the major types of sites and stands and forest management treatments, from an ecological and economic standpoint.

In 1982, two different areas requiring planting were prepared with three different scarifiers to determine which machine could best (1) remove and/or flatten logging residues, thereby increasing planting speed and quality; (2) remove advance hardwoods where desirable, e.g., pin cherry, aspen, etc.; and (3) create favorable microsites for planting container and/or bareroot stock.

Direct Seeding Studies

Direct seeding offers a rapid means of regenerating large areas, either from the ground or air, at a cost considerably lower than for planting. However, escalating seed costs and a shortage of seed have restricted its use in Nova Scotia. A 1982 trial was designed to determined the effect of strip width, shelter cups, and site preparation on seed germination and seedling development.

Christmas Tree Research

To help ensure that the Christmas tree industry in Nova Scotia remains competitive, the section initiated at Loganville, Pictou County, an experiment to determine the effect of various cultural practices on tree quality in balsam fir.

Forest Nursery Research

Nursery stock quality strongly affects the success of any plantation. Con-

tinuing research is needed to ensure that nursery managers have the information required to produce the quality of stock desired.

Nursery research initiated or continued this year included:

1. propagation of black spruce by cuttings
2. control of seedbed density in relation to stock quality and frost-heaving resistance
3. outplanting trials to determine the effects of stock quality and superabsorbents on survival
4. monitoring of stock quality
5. development of soil moisture curves for irrigation purposes.

Articles Published

Rabbit browsing of conifer seedlings. Forest Research Note No. 1. R.E. Bailey and R.D. McNally.

Comparative performance of overwintered frozen and spring-lifted red pine and Norway spruce. Forest Research Note No. 2. P.D. Neily

Current status of the softwood resource on Cape Breton Island. Forest Research Note No. 3. R.E.Bailey

Effects of nursery fertilization on survival and growth of outplanted red pine, red spruce and white spruce. Forest Research Note No. 5. P.D. Neily

Survival of spruce-fir forests treated with ***Bacillus thuringiensis kurstaki*** *on Cape Breton Island.* Forest Technical Note No. 1. R.E. Bailey

A study on the effect of competing vegetation and browsing on early plantation performance. Forest Technical Note No. 5. R. Oxenham

Cone crop and collection, 1982. Forest Technical Note No. 6. P.D. Neily

Stock quality and distribution. 1981. P.D. Neily

Stock quality and distribution. 1982. P.D. Neily

FOREST RESOURCES PLANNING AND MENSURATION DIVISION

FOREST INVENTORY

General

Forests are a living resource in constant flux. Sound forest management, therefore, requires constantly updated data. One of the best ways to collect

and maintain such information is through a recurring inventory. Such an inventory of the province commenced in 1964 with aerial photography of Pictou, Antigonish, Guysborough counties, followed by photo interpretation, cruising, compilation, and reports. By 1971 photography was complete for all counties, and the second cycle began in Pictou, Antigonish, and Guysborough counties. Meanwhile, the subsequent phases took their course, all reporting on a 10-year basis so that no data are more than a decade old. The stages are reviewed below in the order of completion.

To provide current data on forest growth and yield, a province-wide system of 1,765 permanent sample plots (each 0.1 acre [0.0404 ha]) is also employed. These are measured every five years. The first remeasurement of 1965 plots commenced in 1970, the second in 1975.

Aerial Photography

Aerial photography is contracted to private firms a year before the field work begins. During the spring and summer of 1982 aerial photographs were taken of Halifax East using true-color film. From these were produced prints for photo interpretation, scale 1:10 000. This is a departure from the schedule. Normally Cape Breton Island would be photographed next; however, this is being postponed due to the spruce budworm infestation.

Field Work

From April to September a crew of 12 men established 2,000 sample plots in over 400 stands in Hants County and St. Mary's municipality for estimation of forest volumes. Also, data on wildlife habitat are being gathered in conjunction with the field work. From September to December a crew of 14 men remeasured 250 permanent sample plots across the province.

Compilation and Report

The data from the new inventory are being compiled. In addition, the results from the third remeasurement of growth plots have been compiled, and a technical note distributed.

FOREST PRODUCTION

Total commercial forest production for the 1982 calendar year decreased by 25.8 per cent from 1981. Softwood lumber decreased by 12.3 per cent; hardwood lumber decreased by 12.5 per cent. Overall lumber production decreased by 12.4 per cent from 1981.

The number of firms reported as sawing lumber and/or boxwood was 325, the same as in 1981.

Pulpwood export from Nova Scotia in 1982 decreased by 36.5 per cent from 1981, i.e., from 64,298 cords (233 052 m^3 [stacked]) in 1981 to 46,664 cords (169 136 m^3 [stacked]) in 1982.

Of the 96,632,461 cu. ft. (2 736 324 m^3) of primary wood production, 28.7 per cent was acquired by sawmills and 71.3 per cent went to roundwood users. Of the 27,701,910 cu. ft. (784 430 m^3) of primary production processed by sawmills, 10,914,043 cu. ft. (309 051 m^3) went to pulpmills as chips from sawmill residue. Compared to 1981, increases in production were noted for railway ties, pitprops, shingles, and staves and heading.

Decreases were reported for lumber, pulpwood, pulpchips, mine packs, laths, poles and piling, and boxwood.

For details see Appendix, Tables I and IV.

LAND EVALUATION

In 1982-83 fiscal year 4,857 acres (1 966 ha) of area were evaluated for purchase or trade.

SCALING

A policy has been established whereby check scales will be carried out on primary forest products cut under lease or agreement from Crown lands.

The strike which began at the Scott Maritimes pulp mill in September 1982 effectively closed down most of the sawmills in eastern Nova Scotia because they could not sell their wood chips. Consequently this program has not yet been fully instituted.

Individual scalers at Nova Scotia Forest Industries are being checked regularly. We have agreed to provide a maximum of two check scales annually against any scaler. This condition has been written into the agreement between N.S.F.I. and the N.S.F.I. Suppliers Division of the Nova Scotia Woodlot Owners and Operators Association.

Assistance was given to various districts in scaling projects and in resolving problems and complaints.

With representatives of the Weights and Measures Division of the Department of Consumer and Corporate Affairs, the supervisor of scaling attended a meeting of the Scaling Committee of the Canadian Standards Association. This meeting dealt mainly with clarification of problems related to metric measurement of forest products.

The annual Timber Scalers School was held at the agriculture college. A refresher course was held for earlier graduates.

FOREST MANAGEMENT PLANNING

Forest Management Planning

Portions of the section's proposed planning system have been implemented. In particular, subdivision, five-year and annual operating plans have received a positive response from department staff. Long-term, 20-year subdivision plans have been drafted for the North Central subdivision and the South Central subdivision.

This section has also completed adding Queens and Lunenburg counties to the "Managex" computerized mapping system.

Remote Sensing

Two remote-sensing projects were begun in 1982. One is designed to develop procedures for monitoring clearcuts on a provincial basis using satellite "Landsat" imagery and the computerized image analysis system located at the Nova Scotia Land Survey Institute. The second project is intended to evaluate software from the Earth Sensory Resources Institute (ESRI) geo-based information system and to determine the possibility of updating geo-based information systems using satellite imagery.

The results of both projects and their subsequent evaluation should be available in late 1983.

Access Road Engineering

The fiscal year 1982-83 was a relatively quiet year for construction of forest access roads on Crown land. The work carried out in this period was confined to the following.

1. Location of centre line for future construction of Crown land forest access roads amounted to 25 to 30 miles (40 to 48 km) in five subdivisions.

2. Planning forest access road systems on smaller blocks of Crown land in preparation for the new federal/provincial agreement was confined to five subdivisions with unleased Crown lands. Approximately 24 parcels of Crown land in different combinations were planned.

3. Field crews assisted the department machines on road construction in Kings, Annapolis, Antigonish, and Hants counties. Parks and Recreation construction jobs were located in the counties of Halifax (Pennant), Antigonish (Pomquet), and Pictou (Melmerby). Approximately 5-6 miles (8-10 km) of access road have been worked on by department machinery this fiscal year. A machine-time operation study was also carried out.

TIMBER LOAN BOARD

Two different firms applied for five separate parcels of land covering approximately 1,850 acres (749 ha).

After locating, field examination and investigation of physical plant and business, and preparation and presentation of reports to the board, it accepted one application but made no loans in this period.

The Timber Loan Board's chief technician co-ordinated the processing of applications for loans, annual inspections, investigations, and reports required in connection with these accounts.

WILDLIFE DIVISION

NON-GAME

Major non-game projects and activities completed or continued in 1982-83 included:

1. an investigation into the damaging effects of birds on small grains, in co-operation with the provincial Department of Agriculture and the Canadian Wildlife Service

2. the collection of additional information on cormorant food habits in relation to commercial and sports fishing interests

3. island seabird inventories and an assessment of the long-term impact of a marine oil spill on seabird colonies

4. a survey of island plant and animal communities

5. a co-operative program with the Forestry Inventory Subdivision to measure wildlife habitat features
6. monitoring the success of relocating osprey nests from power-line poles to nearby substitute nest platforms
7. province-wide biweekly counts of overwintering eagles (also measuring the numbers and productivity of breeding eagles and studying the wintering eagle population on the Shubenacadie River)

Numerous requests were answered for general non-game information, including many which asked specifically for assistance in dealing with nuisance non-game animals. In addition, several minor pest animal complaints were investigated. Presentations on non-game animals, wildlife habitat, and wildlife-habitat planning were made to various public groups and committees.

BIG GAME

Deer

Big game licenses sold or issued were: 72,686 resident, 9,202 senior citizen, and 862 non-resident, for a total of 82,750 potential hunters during the November 1-30 1982 deer season.

The 34.5 per cent report card return indicated a hunter success rate of 51.6 per cent for residents and 62 per cent for non-residents, resulting in a total calculated legal kill of 42,787. Male deer made up 62.5 per cent of the reported kill.

The calculated kill by county for the 1982 season was:

Kings	1,405	Lunenburg	3,693	Halifax	3,492
Annapolis	1,887	Cumberland	4,064	Hants	3,540
Digby	1,926	Colchester	4,124	Cape Breton	1,195
Yarmouth	2,417	Pictou	2,737	Richmond	1,218
Shelburne	1,754	Antigonish	1,083	Inverness	1,868
Queens	2,045	Guysborough	3,646	Victoria	693

A very mild winter resulted in high survival and good physical condition in the overwintering herd. This should be reflected in high reproduction rates and a larger summer population.

Moose

Because of suspected declines in some areas, as well as budgetary restrictions and the need to reassess our harvest strategies, the moose season was closed in 1982. Pellet group inventories were conducted in the spring as an index of population trends. Results will be compared to spring 1984 counts to determine whether significant changes can be observed. Along with general mortality data, this information will be compared and analysed before recommendations are made.

Black Bear

Interest in black bear foot snaring appears to have peaked in 1980, when 1,126 permits were issued. This year only 787 permits were issued. These are also indications that the bear population has dropped significantly.

Questionnaires returned by 95.5 per cent of a mailout sample of permit holders indicated an average of one bear taken every 3.08 permits. This suggests a snaring kill of 255 bears. In addition, big game license holders indicated a hunter harvest of 163 bears, 9 were reported killed for depredation control, and 7 were killed in collisions with autos. One recorded illegal kill brings the total calculated bear kill in the period to 435 animals.

Of the bears for which sex and age were reported, adult males made up 50 per cent and adult females 26.5 per cent.

Total nuisance bear complaints this year were 72. Twenty-six were reports of bears in the area of homes or fields, five were not confirmed as bear problems, and eight were shown to have involved some other animal.

FURBEARERS

License sales, harvest, and many pelt values for furbearers took a significant decrease in Nova Scotia during the 1982-83 season. License sales were down by 827 to 4,694. The catches of every furbearer except coyote, squirrel, and weasel were down below those of 1981-82. Average pelt value decreased significantly on bobcat, fox, raccoon, and fisher. The marked decrease in harvest of raccoon and bobcat particularly, but also of beaver, muskrat, and mink, was largely responsible for the continuing decline of the total fur harvest value to $729,016 for the 1982-83 fur season.

Data from the bobcat study indicated stocks were reduced, mainly by heavy trapping pressure during a decline in the rabbit population cycle. Increasing rabbit populations plus a second year of delayed snaring should com-

bine to help the recovery of bobcat populations. Continued increase in the coyote population causes concern because of their depressing effect on the future of bobcat, fox, and raccoon populations in particular.

SMALL GAME

Small game license sales have been declining steadily from 40,546 in 1978-79 to 29,769 in 1982-83.

Rabbit harvest has continued to increase since the 1980 low in the cycle. The 547,566 taken last season were also a reflection of the increasing number of rabbit hunters—28,463—and their high take per hunter, namely 19.2.

Similarly, there was an increase in ruffed grouse hunters (22,328), harvest (83,331), and kill per hunter (3.7).

Woodcock harvests have been decreasing since 1979 and are now down to 3,094 birds.

Waterfowl harvest and kill per hunter, on the other hand, showed a marked increase in all categories with a total of 120,198 birds being harvested—an average of 10 per hunter.

Introduced ptarmigan and arctic hare now seem to have stabilized their populations on Scatarie Island.

Small Game License Sales, 1966-67 to 1982-83

1966-67 — 23,742
1967-68 — 26,280
1968-69 — 29,041
1969-70 — 30,648
1970-71 — 31,032
1971-72 — 32,479
1972-73 — 34,023
1973-74 — 44,450
1974-75 — 48,024
1975-76 — 41,233
1976-77 — 37,807
1977-78 — 40,504
1978-79 — 40,546
1979-80 — 36,855
1980-81 — 33,023
1981-82 — 32,642
1982-83 — 29,769

Woodcock

Woodcock singing-ground surveys conducted by department personnel in 1982 indicate a 20 per cent decline in the number of breeding woodcock. This is a further decline from 1981. Harvest data suggest a nearly 50 per cent

reduction in kill. Reduced breeding densities are attributed to inclement weather in the New England states during the 1982 spring migration.

Waterfowl

Due to budgetary restraints population inventories of breeding, staging, and wintering waterfowl were discontinued in 1982-83.

Analysis of past brood-survey data and detailed wetland-inventory data suggests that there are two principal factors which govern the intensity of duck brood rearing in Nova Scotia. These are (1) stabilized water levels (largely due to Ducks Unlimited management or other artificial dams) and (2) the insertion of organic material (fertilizer) into the wetland system. More detailed analysis of these data will more precisely define habitats of significant value to waterfowl (and probably other species as well).

The harvest of waterfowl increased 30 per cent over the 1981-82 season. This brought the harvest level back to approximately that of 1980-81.

During 1982-83, 771 waterfowl were banded: 235 common eider females, 413 black ducks; 10 green-winged teal, and 113 Canada geese.

Wetland Inventories

The freshwater wetlands inventory was completed and a preliminary computer run made by the Canadian Wildlife Service. *Important Freshwater Wetlands and Coastal Wildlife Habitats maps* were produced and a limited number published. Detailed wetland evaluations with recommendations for management were made for approximately 40 wetlands rated important for wildlife.

Lake Fertilization

Increased vegetative growth, fish growth, and mammal and waterfowl breeding densities are indicated on the fertilized study area.

INLAND FISHERIES

Rearing Ponds

A total of 49,502 speckled trout and 32,087 yearling rainbow trout were distributed from the Kelly Lake Fish Culture Station in 1982 (Table XIV, Appendix). The speckled trout were stocked on a "put-and-take" basis, as

yearlings of about eight inches (20 cm), in lakes which are readily accessible to the public. The rainbows are stocked on a "put, grow, and take" basis in four lakes, including Porters Lake. The Porters Lake fish were stocked experimentally to evaluate the suitability of this large brackish lake for rainbows.

Lake and Stream Surveys

As part of a continuing inventory program, 46 lakes and one major stream were surveyed in 1982. So far, 676 lakes and 39 miles (65 km) of stream have been inventoried. In co-operation with the Nova Scotia Department of the Environment, extensive chemical tests were conducted on surveyed lakes to determine their present pH status and future susceptibility to acidic precipitation.

Creel Census

The annual creel census to evaluate the returns of various hatchery stocks to an intensive fishery was carried out at Kelly Lake. Censuses were also done at Lake Ainslie, Inverness County, and in the Black River system of Kings County.

Sea Trout Project

A two-way fish fence was installed for the second year on the South River, Antigonish County, to monitor and tag sea-run trout. This is a co-operative project, also involving Fisheries and Oceans Canada, Saint Francis Xavier University, and the Nova Scotia Department of Fisheries. The fence will operate again in 1983 to gather data on trout already tagged in this study.

Electro-seining

Electro-seining to determine the kinds and abundance of fish was carried out in the Cornwallis River, Kings County; Lake Ainslie tributaries, Inverness County; Porters Lake tributaries, Halifax County; and in tributaries to the Bras d'Or Lakes in all four Cape Breton counties.

Calculated Catch

The calculated catch of speckled trout by licensed anglers in 1982 was 1,833,771, or 22.9 fish per licensee.

WILDLIFE AREAS

Provincial Wildlife Parks

The Provincial Wildlife Park at Shubenacadie was again open daily from May 15 to October 15, 9 a.m. to 7 p.m. The estimated attendance for the year was 300,000, with unusually high week-day traffic.

Canada goose eggs were again obtained from Ontario, and 138 young were liberated on Cape Breton Island. During the year 500 wood ducks were reared and released to different parts of the province in co-operation with Ducks Unlimited. Also, 700 ringneck pheasants were hatched and distributed province-wide to local fish and game people, who reared and released them at maturity.

Upper Clements Wildlife Park continued to enjoy another good year, with attendance in the 100,000 range.

Two Rivers Wildlife Park was partly stocked, and public access was allowed during the summer. New pens are under construction, and new animals are continually being added.

Wildlife Management Areas

The following areas were managed by the department:

Location	Predominant Species	County
Antigonish Harbour	waterfowl	Antigonish
Debert	waterfowl	Colchester
Eastern Shore Island	seabirds	Guysborough-Halifax
Kelly Island	salmonids	Halifax
Pearl Island	seabirds	Lunenburg
Scatarie Island	ptarmigan, arctic hare	Cape Breton
Tobeatic	beaver	(Digby, Yarmouth, Shelburne, Queens)
Minas Basin	Canada goose	Kings
Dewey Creek	waterfowl	Kings

At Manganese Mines in Colchester County the department manages an outdoor education area.

Provincial Sanctuaries

Debert — Colchester County
Chignecto — Cumberland County
Shubenacadie — Colchester County
Waverley — Halifax County
Sunnybrae — Pictou County
Spectacle Island — Victoria County
Two Rivers — Cape Breton County
Blandford — Lunenburg County
Melbourne Lake — Yarmouth County
Martinique Beach — Halifax County
Upper Clements — Annapolis County
Liscomb — Halifax and Guysborough counties

PARKS AND RECREATION DIVISION

ORGANIZATION

The provincial park system is administered by the Parks and Recreation Division in Debert and by field staff in the eight subdivisions and 21 district offices throughout the province. The Parks and Recreation Division is responsible for planning the park system and its individual parks, as well as for preparing development and operation standards and procedures. The Operations Branch is responsible for park maintenance, operation, and policing and, under guidance from Parks Division staff, does most capital construction. The capital budget is administered by the division, which also manages large construction projects.

THE PARK SYSTEM

In 1982, 19 campgrounds and 78 beach and picnic parks were provided for the public. Additional picnic facilities were available at Shubenacadie Wildlife Park, Two Rivers Wildlife Park, and Balmoral Grist Mill. Total operational parkland equalled 16,144 acres (6 533 ha); 27,509 acres (11 137 ha) were held in reserve for future expansion.

During 1982-83 properties totalling 428 acres (173 ha) were acquired. Of this total, 300 acres (121 ha) were acquired at MacNeil Vale and 78 acres (32 ha) at the Barra Forest (both in Victoria County). Other acquisitions included 50 acres (20 ha) at Cole Harbour, Halifax County, and 0.5 acres (0.2 ha) at Dominion Beach, Cape Breton County.

Provincial camping parks opened on May 21 and remained open until October 11 (Thanksgiving Day). Camping fees were set at $6.00 per night, and firewood was sold for $1.00 per bundle. Day-use facilities were available to the public at no charge. Total revenue from camping permits was $279,540.

Park Use

A summary of 1982-83 campground user statistics shows that the park system's 1,457 individual campsites accommodated 120,500 persons for 51,800 party-nights. Usage is about equal to that of the previous year. Out-of-province visitors slightly outnumbered local visitors. The average number of campers per permit was 2.95; their average length of stay was 1.67 nights.

Project Planning and Development

The total divisional budget for planning and development and administration was $1,090,400. Of this, $262,200 was allotted to administration, $259,900 to planning and related programs, $339,800 to park development, and $228,500 to the parks workshop.

Capital development projects were undertaken in 37 parks. This required planning inputs which ranged from site assessments through development of alternative concepts to preparation of detailed site-development plans. The developments varied from minor projects to complex construction, all of which required direction from Parks Division staff.

Some examples of these projects include:

Parks	County	Development
Pomquet	Antigonish	Road and parking lot development
Caribou	Pictou	Landscaping, road upgrading, day-use entrance, site upgrading, beach access
Tidnish Dock	Cumberland	Picnic-area development, landscaping
Taylor Head	Halifax	Trail development
Blomidon	Kings	Landscaping, trail improvement completion of group area
Ellenwood Lake	Yarmouth	Landscaping of new campground sites
Whycocomagh	Inverness	Redevelopment around entry building and picnic area
Two Rivers	Cape Breton	Playground, parking lot edging, picnic area, day-use facilities, water system, sewage system
Mira	Cape Breton	Redevelopment of picnic and camping facilities.

Facilities for Handicapped Persons

Six parks had facilities and/or access installed primarily for use by handicapped persons. Easy-access toilets were installed at Rushtons Beach (Pictou County), Shubenacadie Wildlife Park (Colchester County), Oakfield and Martinique Beach (Halifax County), and Mira River (Cape Breton County). At Sand Hills Beach (Shelburne County) boardwalk access to change house facilities was begun. At Martinique Beach (Halifax County) a boardwalk, bus drop-off area, viewing platform, and specially constructed picnic tables were provided.

Beach and Shoreline Restoration

Dune restoration and stabilization were undertaken at Melmerby Beach (Pictou County), Sand Hills Beach (Shelburne County), and Martinique Beach (Halifax County).

Trails

Upgrading and/or development of new park trails continued at Clam Harbour Beach and Taylor Head (Halifax County), Five Islands (Cumberland County), and Mira River and Two Rivers Wildlife Park (Cape Breton County). A two-year provincial parks trails survey begun in 1982 was continued.

Major Park Planning Projects

Perhaps the most significant park planning project of 1982-83 was the initiation of resource inventory and master planning for the Long Lake Park Reserve (formerly Halifax Watershed Lands). This 5,000-acre (2 000-ha) parcel is situated on the western edge of the City of Halifax. As the province's first major near-urban park, it offers an exciting opportunity for provincial residents generally, but particularly for those in the Metro area.

Another major planning project was the preparation of background information to assist the advisory committee appointed by Cabinet to consider alternative future uses of the Wood property. The division summarized the significant resources of the property and co-ordinated the preparation of several land-use options for the committee and the public to consider. Staff assisted Wildlife Division and Parks Canada representatives to present background information at public information sessions in Port Mouton, Liverpool, and Caledonia, all in Queens County.

Development plans were prepared for a high-quality beach park at Tor Bay, Guysborough County. This property had been leased to the Tor Bay Atlantic Park Association, who developed and operated it. Because of difficulties experienced by this volunteer association, the department reassumed responsibility for management. Funding under the Canada/Nova Scotia Tourism Subsidiary Agreement has made possible essential redevelopment and upgrading to provincial park standards.

Evaluation of potential provincial campground sites in Queens County was undertaken in response to county representation favoring the development of a high-quality coastal park and in recognition of the current lack of camping opportunities adjacent to the Queens County shoreline. Considering the outstanding recreational qualities of the shoreline and the constraints imposed by its rugged topography, settlement, and land ownership, this is a challenging and exciting proposal. In all, approximately 15 sites were reviewed.

Other planning projects include Pollett Cove-Meat Cove, a wildland trail system in northern Inverness County; West Mabou Beach, a proposed beach development and resort complex in Inverness County (undertaken jointly with DEVCO); Lake Charlotte, a proposed campground associated with the Eastern Shore Seaside Park System; and Cole Harbour-Lawrencetown, major beach developments in Halifax County.

INTEGRATED RESOURCE MANAGEMENT

The division participated in a new planning process to integrate forestry, wildlife, and outdoor recreation programs and objectives on Crown lands. During the 1982-83 fiscal year the preparation of such plans was initiated for the following subdivisions: North Central, South Central, Valley, South Shore, and Western. In addition, several annual operating plans were reviewed to ensure the co-ordination of commercial forestry and outdoor recreation activities.

NATURAL HISTORY RESOURCES

Another significant achievement was the completion of the report entitled the "Natural History of Nova Scotia" to working draft stage. This report has been distributed to recognized natural history specialists and selected potential users for review and comment. Revisions and the publication of a final report for general distribution are scheduled currently for fiscal year 1983-84.

This report is intended as a reference manual that will provide a framework within which the significant natural history resources of the province can be understood, protected, and interpreted. Although its primary applications will be in planning and managing provincial parks and special places, its comprehensive scope will make it useful in areas such as outdoor education, land-use planning, and resource management. The project was sponsored jointly by the departments of Lands and Forests and Education (Nova Scotia Museum).

INTERPRETATION, BROCHURES, AND PARK-USER INFORMATION

Efforts to expand interpretation within provincial parks were continued in 1981-82. Two interpretive displays were erected at Five Islands Provincial Park, emphasizing the geology, the tides, and the estuary. In addition, brochures were prepared to promote winter use and skiing in Five Islands and Beaver Mountain Provincial parks.

Expanded information on provincial parks was included in the Department of Tourism's *Nova Scotia Treasure Guide*, which will enable both residents and tourists to make more effective year-round use of the park system.

An estimated one-quarter of staff time was spent in responding to a wide variety of requests, proposals, and complaints.

LAND SERVICES BRANCH

424-5481

The Land Services Branch consists of the following: the Land Acquisition and Registry Division, the Surveys Division, and the Provincial Crown Lands Record Centre.

Land Acquisition and Registry Division. The Land Acquisition and Registry Division (424-4267) is responsible for the acquisition and disposal of Crown lands administered by the Department of Lands and Forests and acts on behalf of other departments and agencies in the acquisition and disposal of land. The division prepares all legal documentation related to deeds, leases, grants, licenses, certificates, and letters of authority.

Necessary legal and other documentation for the Beaches Preservation and Protection Act, Land Titles Clarification Act, Land Holding Disclosure Act, and Parks Development Act are prepared by the division. A large number of expropriations are carried out in co-operation with the expropriating authority.

All quieting of titles actions are referred to the division prior to court proceedings to determine if the Department of Lands and Forests has an interest in the action.

The Registry Section of the division acts as custodian for all Crown land records dating back to 1730. Thousands of inquiries from the public related to land title problems are handled annually.

The division is responsible for the investigation and settlement of claims to ungranted land.

Surveys Division. The primary objective of the Surveys Divison (424-5020) is to survey, monument, and map the Crown lands administered by the department and to maintain surveyed Crown land boundaries. In addition, it has the following secondary objectives: to survey lands for purchase or expropriation; to provide a drafting and mapping service in support of departmental programs; to survey lands which the department wishes to protect for environmental, recreational, or cultural purposes; to provide a surveying service to other government departments or agencies; and to acquire aerial photography.

Provincial Crown Lands Record Centre. The Provincial Crown Lands Record Centre, 45 Alderney Drive, Queen Square, Dartmouth (424-8680) co-ordinates

and consolidates information related to all provincial land holdings for all government departments and agencies (including boards, corporations, and commissions). It updates the Crown Lands Record and Resource Series Maps; microfilms and stores related deeds, leases and rights-of-way; and provides statistical data for departments and agencies. These data are required to co-ordinate acquisition and disposal of land and to develop land-use policies and plans.

On request, the Provincial Crown Lands Record Centre also provides these types of statistical data and visual-display material to the public and to federal or municipal departments and agencies.

SURVEYS DIVISION

ADMINISTRATION

The Administration Section is made up of four persons in management and a support staff of eight. The support group is made up of secretarial services, plan examination, and research groups.

Requests for surveys come from various divisions of this department as well as from other departments of the government. One hundred and seventy requests were received for technical and legal surveys in 1982-83. Returns of survey were received for 72 orders issued this year and for 51 orders issued in previous years. One hundred and ninety-two plans were inspected, processed, and filed. One hundred and twenty-six plans and descriptions were prepared and approved pursuant to Section 30(1) of the Lands and Forests Act. These form part of a certificate of release issued by the Crown asserting no interest or claim to the corresponding parcel of ungranted land. The section negotiated a contract with Atlantic Canada Airborne Sensing in Amherst for vertical color aerial photography covering the east half of Halifax County.

The Surveys Division also provides inspection of condominium plans on behalf of the Registrar of Condominiums. During this period inspection was made on plans of three such projects with a total of 107 apartments-type units. Plans were drafted for 20 surveys and 111 leases and grants.

CROWN LAND SURVEYS

The total area of Crown land surveyed during the year was 41,862 acres (16 941 ha). This required 267 miles (429 km) of boundary line, 345 miles (555 km) of trial and tie lines, and the placing of 1,168 survey monuments.

To date Crown land surveyed and monumented totals 3,398,833 acres (1 375 461 ha).

Distribution of Crown land surveyed in 1982-83 was as follows:

County	Area (Acres)	Area (Ha)
Annapolis	212	86
Antigonish	670	271
Cape Breton	1,957	792
Colchester	3,363	1 361
Cumberland	33	13
Digby	747	302
Guysborough	5,906	2 390
Halifax	6,173	2 498
Hants	5,327	2 156
Inverness	1,206	488
Lunenburg	617	250
Pictou	70	28
Queens	187	76
Richmond	1,566	634
Shelburne	153	62
Victoria	13,358	5 406
Yarmouth	317	128
	41,862	16 941

Related survey work included two surveys for expropriation purposes, four lots surveyed within land titles clarification areas, supervision of boundary-line maintenance crews hired under the provincial summer employment program and the provincial winter works program, one survey for a community pasture, two site surveys, the cross-sectioning of two beaches for assessment of erosion, one survey to establish control for mapping, a survey to determine high-water mark on a protected beach, 214 targets placed on survey monuments for control of mapping from aerial photographs, and 12 man-days spent on forest fire suppression.

Boundary Line Maintenance

During the year 359 miles (578 km) of Crown land boundary line were renewed by Surveys Division staff and 475 survey monuments were replaced. Operations staff assisted in the program, and during the year renewed 430 miles (692 km) of boundary and replaced 758 monuments. In total 789 miles (1 270 km) of boundary were renewed and 1,233 survey monuments replaced.

SPECIAL PROJECT SURVEYS

The Special Projects Section is responsible for surveys which generally fall outside the scope of the Crown Land Surveys program. These include engineering surveys, surveys for land protection, and purchases and expropriations. During the year 37 special projects surveys were completed, including surveys for the Department of Government Services and the Department of Development as well as for the Department of Lands and Forests.

MAPPING

The mapping section is composed of three groups: Photogrammetry, Cartography, and Reproduction.

Photogrammetry

The Photogrammetry Section consists of two photogrammetric technicians who use an A-8 stereographic plotter, co-ordinograph, digitizer, and computation equipment.

Mapping in manuscript form was completed for four sites in the province. The areas are: Indian Fields, Shelburne County; Five Islands, Colchester County; Peggys Cove and adjacent area and Dollar Lake, Halifax County. Quality inspection of aerial photography flown for the department over the eastern portion of Halifax County was carried out during a two-month period by one photogrammetric technician.

Cartography

The cartographic group consists of three units: orthophoto mapping, special assignments, and Crown land property mapping, employing nine drafting technicians.

Orthophoto Mapping Unit

The Orthophoto Unit continued with a program of developing a series of forest inventory map sheets on the 1:10 000 orthophoto resource base. During the period, plotting was completed on 110 sheets, yielding a new project total of 1,064 map sheets plotted. Plotting of Crown land boundary has been completed for Inverness and Victoria counties and 70 per cent of Richmond County. Additional Crown boundary survey was plotted, and 150 map sheets were revised on the eastern mainland. Forty-seven forest type maps were completed, finalizing work in the Eastern subdivision. This unit has a complement of three drafting technicians.

Special Assignment Unit

The Special Assignment Unit produced 39 forest type Crown land maps at a scale of 1:15 840; researched, tabulated, and updated 220 map sheets showing Nova Scotia Pulp Limited licensed Crown land in the seven eastern counties; and updated 542 maps of the province showing Crown boundary lines. Twenty-three special maps for spruce budworm assessment were completed.

Twenty large-scale topographic maps were produced by this unit from manuscripts prepared by the photogrammetric group: 10 were of Peggys Cove and adjacent area, four of Five Islands, and six of Waterside. Thirty-four other projects were undertaken and completed for various sections of operations and administration divisions of the department. This unit has three drafting technicians.

Crown Land Property Mapping Unit

The Crown Land Property Mapping Unit has the responsibility of identifying all lands under the administration and control of the Department of Lands and Forests. The unit continued working with the Systems and Computer Division of Government Services on the development of the Crown land cadastral information system to be used in conjunction with the present 1:15 840 map series. The "Preliminary Design Report" is presently under detailed review and examination. Funding has been allocated for installation of processing equipment. Upon finalization of program design, data capture and storage process will begin. In preparation, updating of the existing 1:15 840 scale map series for the province is ongoing. This unit has three drafting technicians.

Reproduction

The reproduction group is composed of a darkroom and air photo library and map reproduction units.

Darkroom

The darkroom, using a photomechanical contact-process vacuum frame, produces film positives, negatives, and papers required by the cartographic group in revising existing plans and producing large-scale and orthophoto forest type mapping. In this fiscal year 321 requests were received which required processing of 1,049 pieces of materials.

T[illegible]ve requests from the orthophoto mapping unit required processing 78 pieces of film. Forty-seven forest type maps at 1:10 000 scale and 39 at

1:15 840 scale were completed. One hundred and twenty-two film positives were processed for Surveys Division and seven plans for the Land Acquisition and Registry Division. In addition, the unit processed 142 plans of Section 30 (1) Certificates and 580 other pieces of material for various sections of the department. Seventeen pieces of material were processed for other government departments. Thirty-four requests for camera services were also carried out. This unit has one darkroom technician.

Air Photo Library

The Air Photo Library is stocked with some 182,600 aerial photographs which provide coverage of the province dating from 1927 to the present. The general public is permitted only to view the photographs. Assistance is given in ordering prints they require from the National Air Photo Library, Ottawa or from Maritime Resource Management Services in Amherst. This service is also extended to other government departments and agencies. During the past year staff dealt with approximately 1,600 requests.

Map Reproduction Unit

The Map Reproduction Unit is administered by the same staff as the Air Photo Library and has on file almost all the film positives of the departmental map sheets, as well as reproducible orthophoto resource and large-scale urban map sheets provided by the Land Registration and Information Service (L.R.I.S.), Summerside, P.E.I.

During this fiscal year 187 planimetric and 188 topographic urban map sheets, 160 resource series (planimetric and topographic map sheets), and 160 resource series orthophoto (planimetric and topographic film reproducible tracings) were received from L.R.I.S.

Originally the Map Reproduction Unit was created to provide a reproduction service for departmental use only. During the past 15 years service has gradually expanded to meet the demands of the general public and other government agencies. Service demand during the past year resulted in 18,000 map sheets reproduced for departmental use, 5,400 for other government agencies, and approximately 9,500 sold to the general public. This unit has a staff of two.

LAND ACQUISITION AND REGISTRY DIVISION

LAND REGISTRY AND RESEARCH SECTION

Approximately 2,700 requests from the public, provincial and federal government departments, and Land and Forests staff were processed. Some 1,300

required searching Land Registry and Research records, and about 1,200 required a written reply, along with copies of old records.

The section recorded and/or posted 428 documents: 67 land purchases, 56 disposal documents, 34 confirmed Crown papers, 98 Section 30(1) certificates, 13 grant documents, 28 lease documents, 24 rejected petitions, 33 certificates of title, 55 survey plans, and 20 contracts and agreements.

Five index sheets were revised; 243 petition numbers were issued; 127 miscellaneous drafting assignments carried out; 138 lots were plotted on aerial photos for the Claims Section; and 46 quieting of titles files were dealt with.

Approximately 2,000 microfilm jackets containing grant document microfilm were replaced, and Crown land correspondence from 1946 to 1976 was microfilmed.

For location of Crown land to date, and acreage and extent of lands reconveyed to the Crown, see Tables XVI, XVII, and XVIII, Appendix.

Land Administration

Transfers

The administration and control of 18 parcels of Crown land was transferred to other provincial departments and to the federal government.

Grants

Three grants were issued involving approximately 100 acres (40 ha).

Deeds

Twenty-seven deeds were issued involving approximately 1,260 acres (510 ha).

Letters of Authority

Forty-two letters of authority were prepared for mineral exploration, construction purposes, and a variety of domestic purposes.

Beaches

One area was designated as a beach under the Beaches Preservation and Protection Act.

Parks

Eight areas were designated as provincial parks under the Provincial Parks Act.

Certificates—Land Titles Clarification Act

Thirty-four Certificates of Title were issued under the Land Titles Clarification Act. These certificates were issued in the communities of:

New Road Settlement, Halifax County, 6
East Preston, Halifax County, 7
Cherry Brook, Halifax County, 1
Oldham, Halifax County, 3
Neils Harbour, Victoria County, 9
Little Dover, Guysborough County, 3
Drumhead, Guysborough County, 3
Seal Harbour, Guysborough County, 1
Sampsons Cove, Little Anse, Richmond County, 1

Certificates—Lands and Forests Act

One hundred and fifteen certificates were issued under Section 30(1) of the Lands and Forests Act. These certificates released the Crown's interest in approximately 28,569 acres (11 561 ha) of land.

Tenders

Tenders were called on eight parcels for stumpage and 53 parcels of sawlogs, pulpwood, studwood, and Christmas trees.

Eighteen special tenders were called for: one road construction project, seven tree planting projects, two leases of land, the disposal of one building, two budworm spraying projects, disposal of land, hay, a canteen concession, fuelwood, and house logs.

Timber Licenses

Twelve timber licenses were issued for cutting Crown land stumpage.

Leases

Thirty-six leases involving approximately 1,442 acres (584 ha) of land were issued.

19	Campsites
2	Recreational
2	Agriculture (sugar bush)
1	Camping park
3	Hangar site
1	Airport site
1	Firefighters' school
4	Boy Scouts
1	Fisheries and Oceans (Canada)
2	Public Service Commission

Trespasses

Twelve trespasses on Crown land were reported, and 11 notices to remove illegal camps were issued.

PROVINCIAL CROWN LANDS RECORD CENTRE

Pertinent information and documents relating to land holdings of 20 government departments and agencies were received by the centre. To date, title, legal, and statistical information relating to 23,885 parcels of land have been processed, and the location and land use of the properties plotted on series maps. Records of these transactions—indentures, deeds, abstracts, certificates of title, where available—have been microfilmed and the documents stored.

Limited research on the Nova Scotia Hospital property was carried out in the past year. Five additional documents were uncovered pertaining to provincial lands not previously recorded, which resulted in more accurate boundary information and complete title information.

OPERATIONS BRANCH

424-5826

The Operations Branch is responsible for implementing and maintaining the department's programs in forest fire control; protection of beaches, fish, and wildlife; enforcement of fish and game regulations; management of the Crown lands, including timber sales and forest improvement; administering programs of assistance to private woodland owners, including a management advisory service; constructing and operating provincial parks and other outdoor recreation areas; administering designated game sanctuaries; providing field assistance in planning, data collection, and other services in Crown land administration and resource education; and the gathering of statistics on forest resource use.

The branch functions through its senior staff located in Halifax and Shubenacadie and through eight geographical subdivisions.

The Provincial Forest Fire Control Centre, P.O. Box 130, Shubenancadie, N.S. B0N 2H0 (758-2232) is responsible for the acquisition, distribution, and maintenance of fire control equipment, the motor vehicle fleet and heavy equipment. The Fire Control Centre is also responsible for the operation and maintenance of the Integrated Mobile Radio System servicing user departments and agencies of government, hospitals and ambulances, fire departments, and the RCMP.

The province is divided into eight roughly equal geographical subdivisions, each staffed with a resource manager, a Crown lands forester, a private lands forester, and in most cases a biologist. Within the subdivisions are districts headed by supervisors and staffed by forest technicians, field clerks, maintenance personnel, and forestry crews. This staff implements the Operations Branch programs.

OPERATIONS FIELD OFFICES

WESTERN
(Yarmouth, Digby, Shelburne counties)

10 Starr's Road
Yarmouth, N.S.
B5A 2T1
(742-4196)

P.O. Box 369
Shelburne, N.S.
B0T 1W0
(875-2501)

P.O. Box 367
Digby, N.S.
B0V 1A0
(245-2164)

Kemptville Depot
Kemptville, N.S.
B0W 1Y0
(761-2227)

SOUTH SHORE
(Queens, Lunenburg counties)

99 High Street
Provincial Building
Bridgewater, N.S.
B4V 1V8
(543-8167)

McGowan Lake Depot
Caledonia, N.s.
(242-2550)

P.O. Box 190
Milton, N.S.
B0T 1P0
(364-3462)

Wiles Lake Depot
Bridgewater, N.S.
(543-2394)

Chester Grant Depot
Chester, N.S.
(275-3574)

VALLEY
(Annapolis, Kings counties)

120 Exhibition Street
Provincial Building
Kentville, N.S.
B4N 4E5
(678-8907)

P.O. Box 130
Lawrencetown, N.S
B0S 1M0
(584-2229)

SOUTH CENTRAL
(Halifax, Hants counties)

Box 23, Site 2
RR#1 Waverley, N.S.
B0N 2S0
(861-2560)

Musquodoboit Harbour, N.S.
B0J 2L0
(889-2332)

Middle Musquodoboit, N.S.
B0N 1X0
(384-2290)

P.O. Box 130
Shubenacadie, N.S.
B0N 2H0
(758-3437)

Stanley Hangar
RR#1 Scotch Village, N.S.
B0N 2G0
(372-2410)

P.O. Box 190
Windsor, N.S.
B0N 2T0
(798-2016)

Lewis Lake Depot
RR#3 Armdale, N.S.
B3L 4J3
(876-2308)

NORTH CENTRAL
(Cumberland, Colchester counties)

626 College Road
Bible Hill, N.S.
B2N 2R2
(895-6325)

P.O. Box 130
Oxford, N.S.
B0M 1P0
(447-2115)

P.O. Box 428
Parrsboro, N.S.
B0M 1S0
(254-3241)

EASTERN
(Pictou, Guysborough, Antigonish counties)

11 James Street
Provincial Building
Antigonish, N.S.
B2G 1R6
(863-4513)

P.O. Box 50
Guysborough, N.S.
B0H 1N0
(533-3503)

RR#2 Aspen
Guysborough Co., N.S.
B0H 1E0
(522-2024)

603 Maritime Building
New Glasgow, N.S.
B2H 2P9
(752-3181)

Antigonish Depot
(863-1502)

MacLellan's Brook Depot
(752-5247)

North Riverside Depot
Guysborough, N.S.
(533-3333)

CAPE BRETON NORTH
(Inverness, Victoria counties)

P.O. Box 68
Baddeck, N.S.
B0E 2H0
(295-2554)

P.O. Box 130
Whycocomagh, N.S.
B0E 3M0
(765-2339)

CAPE BRETON SOUTH
(Richmond, Cape Breton counties)

Coxheath Depot
RR#6 Sydney, N.S.
B1P 6T2
(564-6389)

Provincial Building
St. Peter's, N.S.
B0E 3B0
(535-2032)

CROWN LAND FOREST MANAGEMENT

CROWN LANDS UNDER WOOD SUPPLY AGREEMENTS

Nova Scotia Pulp Limited, Point Tupper

The 50-year license agreement (wood supply and forest improvement) with Nova Scotia Pulp at Point Tupper involved 1,251,668 acres (506 543 ha) of Crown land in the seven eastern counties with additional areas being added yearly. By 1986, a total of 1,500,000 acres (607 042 ha) will have been placed under company management.

In the calendar year 1982, 268,183 cords (972 033 m^3 [stacked]) of softwood pulpwood and 15,409 cords (37 088 m^3 [stacked]) of hardwood pulpwood were delivered to the mill from Crown lands. Of the softwood pulpwood 235,504 cords (853 588 m^3 [stacked]) were salvaged from blowdown and insect-damaged material. In addition, 364 cords (1 318 m^3 [stacked]) of hardwood fuelwood, 157,471 board feet of softwood sawlogs, 118,249 board feet of hardwood sawlogs, 944 cords (3 423 m^3[stacked]) of softwood pulpwood and 179 cords (649 m^3[stacked]) of hardwood pulpwood were produced for sale elsewhere. The agreement calls for an average annual allowable harvest of 330,000 cords (1 196 104 m^3 [stacked]).

Under the Forest Resource Development Agreement funding was available for silvicultural treatments on Crown lands. As well, under the company's license agreement the province returned to the company a stumpage rebate for assistance in future forest-improvement work. During 1982 the

following treatments were carried out: 2,669 acres (1 080 ha) of planting; 1,688 acres (683 ha) of site preparation; 6,397 acres (2 589 ha) of clearcutting; 10,818 acres (4 378 ha) of cutover clearing; 4,828 acres (1 954 ha) of spacing; and 289 acres (117 ha) of hardwood control.

All harvesting and forest improvement proposals are submitted to the department for prior approval in the form of annual cutting plans and annual silviculture plans. These show in detail the stands to be harvested or treated silviculturally. Field checks are made by the department staff before decisions are made. A second check is made by field staff during operations on approved jobs.

E.M. Comeau and Sons (1977) Limited, Meteghan, Digby County

This agreement, signed on December 6, 1976, gives the company the right to cut stumpage on Crown land in the Blackadar Brook of Digby County for a period of 10 years commencing September 1, 1975. During 1982 the company cut 190,481 board feet of softwood sawlogs, 12,336 board feet of hardwood sawlogs, 94 cords (340 m^3 [stacked]) of softwood pulpwood, 65 cords (236 m^3 [stacked])of hardwood fuelwood, and 46 cords (166 m^3 [stacked]) of hardwood lathwood.

Alwood Products Limited

This agreement, which gave the company the right to cut stumpage on Crown land in the Fifth Lake area of Digby County, expired on March 9, 1982.

Between January 1 and March 9, 1982 the company cut 359,627 board feet of white pine sawlogs and 121,035 board feet of other softwood sawlogs.

Long Lake Lumber Limited, Shelburne

Long Lake Lumber Limited has two stumpage agreements on Crown lands. The first agreement was signed on December 4, 1979 and allows the company to cut stumpage on Crown land for a period of 10 years, commencing January 1, 1979.

The second agreement was signed on April 8, 1982 and gives the company the right to cut stumpage on 1,230 acres (498 ha) of Crown land at Middle Ohio for a period of 10 years terminating December 31, 1991.

In 1982 the company cut 1,046,941 board feet of softwood sawlogs, 4,321 board feet of hardwood sawlogs and 150 cords (543 m^3 [stacked]) of hardwood fuelwood.

Scott Maritimes Ltd., Abercrombie Point

During the calendar year 1982, 18,170 cords (65 858 m^3 [stacked]) of softwood pulpwood, 299 cords (1 085 m^3 [stacked]) of hardwood pulpwood, 2,137,153 board feet of softwood sawlogs, and 1,441 cords (5224 m^3 [stacked]) of fuelwood were produced from 203,000 acres (82 153 ha) under the agreement. The agreement provides for the average production of 50,000 cords (181 228 m^3 [stacked]) annually.

Under an annual agreement this company received a stumpage rebate for the performance of silviculture on the licensed Crown lands. During 1982, Scott Paper Company carried out the following silvicultural treatments on Crown lands: 124 acres (50 ha) of planting, 79 acres (32 ha) of cleaning, and 47 acres (19 ha) of shelterwood cutting.

All activities to be carried out on these lands must be submitted for prior approval in the form of a five-year management plan to the department. The plan must follow the guidelines agreed upon by the company and the province and show, in general, where operations are to take place, what products are to be extracted, and the proposed road construction. These areas are checked in the field by the department staff and approval or otherwise is recommended. The annual cutting plan and the annual silviculture plan identify specific locations of various operations.

Riversdale Lumber Company, Truro

This 10-year stumpage agreement, signed in November, 1974, gave the company the right to cut 5,750,000 cubic feet (162 822 m^3) of wood products in Colchester and Halifax counties during the first five years. For the remaining five years of this agreement the company is granted the right to cut a maximum of 1,150,000 cubic feet (32 564 m^3) of wood per year (exclusive of any deficiency carried over from the initial five-year period).

In 1982, the company cut 4,335 cords (15 713 m^3 [stacked]) of softwood pulpwood, 613 cords (2 294 m^3 [stacked]) of hardwood pulpwood, 2,240,821 board feet of softwood sawlogs, 199 cords (721 m^3 [stacked]) of softwood studwood, and 1,617 cords (5 861 m^3 [stacked]) of fuelwood from their limits.

G. Royce Hefler Limited, Lower Sackville, Halifax County

This license agreement allows the company to cut a maximum of 50,000 cubic feet (1 416 m^3) of merchantable softwood and hardwood per year so as to

include a total of 1,200,000 board feet of sawlogs during the 10-year term of the agreement (September 8, 1977 to September 7, 1987).

During 1982 there were 236,028 board feet of softwood sawlogs cut under this agreement.

Elmsdale Lumber Company, Elmsdale, Hants County

This license agreement covering a 10-year period was signed on May 19, 1977 and allows the company an average maximum cut of 240,000 cubic feet of softwood and hardwood.

During 1982, the company received 492,567 board feet of softwood sawlogs under this agreement.

Hoeg Brothers Lumber Ltd., Athol, Cumberland County

This agreement, signed on May 6, 1981, gives the company the right to cut stumpage on Crown land for a period of 10 years commencing January 1, 1981 and ending December 31, 1990.

During 1982, the company received 200,500 board feet of softwood sawlogs and seven cords (25 m^3 [stacked]) of softwood pulpwood.

Kingston Lumber and Building Supplies Limited

This license agreement grants the company the right, for a term of 10 years commencing January 1, 1982 and ending December 31, 1991, to cut 300,000 board feet of sawlog or studwood stumpage from those stands on Crown land designated by the province.

In 1982 the Company cut 414,707 board feet of softwood sawlogs, 24 cords (87 m^3 [stacked]) of hardwood pulpwood and 199 cords (721 m^3 [stacked]) of softwood pulpwood.

Harry Freeman and Sons Ltd., Greenfield, Queens County

This license agreement, signed January 1, 1979, allows the company to cut 300,000 board feet of sawlog stumpage each year during the full term of the agreement. If, during the year of the term of this agreement, the quantities of forest products have not been cut, the company may cut additional quantities of forest products to make up for the deficiency. The maximum quantity of forest products that may be cut by the company in any one year is 450,000 board feet of sawlog stumpage.

In 1982, the company cut 329,213 board feet of softwood sawlogs, 2,418 board feet of hardwood sawlogs, 406 cords (1 473 m^3 [stacked]) of softwood pulpwood and 223 cords (870 m^3 [stacked]) of hardwood pulpwood.

Masonite Canada Ltd., East River, Lunenburg County

The 10-year stumpage and roundwood sale agreement with Masonite Canada Ltd., signed in December 1976, calls for the Crown to supply the mill with 10,000 cords (36 246 m^3 [stacked]) (75 per cent hardwood) on the company's request). Also, the company can extract 15,000 cords (54 368 m^3 [stacked]) annually from those Crown lands in the counties of Hants, Halifax, Annapolis, Kings, Lunenburg, Queens, Shelburne, Yarmouth, and Digby that are especially allocated by the provinces via five-year management plans. This agreement also requires the company to submit annual cutting plans for its licensed lands.

Masonite purchased 666 cords (2 415 m^3 [stacked]) of softwood pulpwood, 1,238 cords (4 486 m^3 [stacked]) of hardwood pulpwood, 655 board feet of hardwood sawlogs, and 135,473 board feet of softwood sawlog stumpage from the Crown.

Gas Tax - Access Road Program

This program, administered by the Nova Scotia Forest Products Association, was initiated in 1967. It provides assistance to forest operators to build access roads for harvesting forest products, to carry out forest improvement work, and to improve access for firefighting. The assistance is in lieu of refunding the tax on gasoline and diesel fuel paid by forest operators for off-highway hauling.

In 1982, a total of 344 applications were received that totalled a requested assistance of $2,005,957. A total of 295 applicants completed their work and received assistance under the 1982 program. Six other applications were completed but had to be funded under the 1983 budget. Forty-three applications were not completed, of which 13 were cancelled and 30 were held over for the 1983 program.

A total of 170.4 miles (274.2 km) of new forest access roads were built requiring 73,359 cubic yards of gravel and five new bridges. An additional 103.5 miles (166.6 km) of existing roads were upgraded using 9,919 cubic yards of gravel. Assistance totalled $805,000 on the completed applications.

UNLEASED CROWN LANDS

Most of the unleased Crown lands are situated in the central and western parts of the province. The large units or blocks have been placed under management plans drawn up on consultation with the Forest Planning Branch.

Access Roads

Construction was completed on approximately 13 miles (21 km) of forest access roads during 1982. There also were 30 miles (48 km) of centre line located in five subdivisions for future construction. Maintenance was carried out on approximately 422 miles (675 km); 411 miles (658 km) were graded; 11 miles (17 km) were gravelled; and two new bridges and 40 culverts were built.

Stand Improvement

The following stand improvement work was carried out on unleased Crown lands:

Type of Work	Acres	Hectares
Planting	1,074	435
Cleaning	47	19
Merchantable thinning	128	52
Site preparation	304	123
Clear Out	420	170
Stand conversion	22	9
Uniform shelterwood	91	37
Weeding	489	198
Strip cut	17	7
Strip shelterwood	15	6
Pre-merchantable thinning	96	39

Forest Products Sales

Fuelwood Sales

Letters of authority and standing permits were issued in 1982 to the many citizens requesting fuelwood. During the calender year 18,623 cords (67 500 m^3 [stacked]) of fuelwood were cut off unleased Crown lands and lands leased to the forest industries, co-operating with the provincial government.

Timber Licenses

Nine timber licenses granting short-term cutting rights on parcels of Crown land ready to be harvested were issued to successful tenderers following advertisements.

Sales by Tender (Roadside)

Material produced on Crown land by contracts or by department crews is usually advertised for sale by tender. The successful bidder is then granted a letter of authority to remove the material. During the year 73 parcels of sawlogs, pulpwood, fuelwood, and studwood, etc., were sold by letter of authority to the highest bidder.

General Letters of Authority

The following types of authorization were given by letter of authority: cutting and removal of forest products; aggregate material from beaches and inland deposits, quarried rocks; construction of access roads; Christmas tree wreath material; other uses of Crown land on a short-term basis. A total of 2,058 such letters were newly authorized.

PRIVATE LAND FOREST MANAGEMENT

MANAGEMENT ASSISTANCE

The Subsidiary Agreement for Forestry between the province and the federal Department of Regional Economic Expansion was signed June 28, 1977. The agreement expired March 31, 1982 with provisions for a one-year cleanup period to fulfill previous commitments.

Work completed under the Subsidiary Agreement for Forestry on Private Lands was as follows (group ventures not included): roads, 473 miles (762 km); bounderies, 1,100 miles (1 771 km); ponds, 562; and silviculture, 174,892 acres (70 806 ha). An additional 152 miles (244 km) of roads were under construction.

Department staff and forestry consultants prepared 2,000 forest management plans for small private lands, placing 389,267 acres (157 598 ha) under management. (This figure does not include group ventures.)

All the objectives of the project were achieved or exceeded, owing to the high interest and activity by woodlot operators and industry.

The Forest Resource Development Agreement was signed August 31, 1982 for a five-year period commencing April 1, 1982. The Forest Resource Enhancement on Private Lands program was implemented and funded by Canada, while the province employed sufficient staff to prescribe and monitor forest management activities implemented by Canada on private lands.

Work completed under this agreement as of March 31, 1983 on private lands was as follows (group ventures not included): roads, 28 miles (45 km); bridges, 2; boundaries, 130 miles (209 km); ponds, 18; and silviculture, 20,353 acres (8 240 ha). An additional 30 miles (48 km) of roads were under construction.

At the end of the 1981-82 fiscal year 758 applicants for small private forest management plans were on file. Department staff and forestry consultants prepared 135 small private forest management plans to bring the total number of plans to 2,135. Again, this number does not include group ventures.

Three pulp and paper companies and three large landowners in the 5,000 acres (2 000 ha)-and-over class continued to be active.

For a detailed summary see Appendix, Table XIX.

GROUP MANAGEMENT VENTURES PROJECT

Object

This year's activities were curtailed as a result of limited funding under the Subsidiary Agreement for Forestry (General Development Agreement). For a summary of each group's activities and current status as of March 31, 1983, see Table XX, Appendix.

The object of the project is to increase the future harvest from private lands by encouraging the assembly of small woodlots into large operating areas and by providing forest management of these operating areas. The Province and Canada now have agreements with eight groups: West Pictou Forest Owners Ltd.; North Nova Forest Owners Co-op Limited; Baddeck Valley Wood Producers Co-op Ltd.; La Forêt Acadienne Ltée.; North Mountain Woodlands Ltd.; Sissiboo Forest Management Ltd.; Conform Limited; and Athol Co-operative Limited. As of March 31, 1983 these groups had 660 Management and Marketing Agreements with woodlot owners/shareholders, for a total of 99,354 acres (40 207 ha) under forest management.

Operation and Administration

Under the general direction of a board of directors the eight groups claimed $467,678 for operating costs. This includes the cruising and compilation of inventory for 67 forest management plans. (Two groups, West Pictou Forest Owners Ltd. and North Nova Forest Owners Co-op Limited, commenced recruising and recompiling plans prepared prior to the Subsidiary Agreement for Forestry.) It also covers the co-ordination of these and other plans into an annual operational plan, and sale of 1,048,480 cubic feet (29 690 m^3) of wood. These sales contributed an additional $21,594 to offset operating and administration costs.

Wood sales were slow owing to poor marketing conditions, which curtailed certain silviculture treatments that produce low-quality pulpwood.

Because of the Canada/Nova Scotia Forest Resource Development Agreement (FRDA), signed August 31, 1982, amendments to the groups' agreements with the Province and with Canada were negotiated.

Forest Improvement Operations

Forest-improvement operations were limited, but funding under the Subsidiary Agreement for Forestry was available for tree planting in 1982 on sites prepared in 1981: $66,632 was claimed for 465 acres (188 ha) of planting. The groups carried out an additional 899 acres (364 ha) of silviculture treatments under the FRDA. In total the following work has been done since 1978:

	1982-83	1981-82	1980-81	1979-80	1978-79
Road construction miles (km)	40 (64)	94 (151)	96 (155)	76 (122)	50 (81)
Boundaries miles (km)	15 (24)	190 (306)	154 (248)	213 (343)	92 (148)
Ponds number	3	29	42	17	6
Silviculture acres (ha)	1,364 (552)	3,803 (1 539)	2,583 (1 045)	1,523 (616)	360 (146)

PROTECTION SERVICES

FOREST PROTECTION (FIRE)

For the third year in a row Nova Scotia experienced a very light fire season, due mostly to wet conditions: 491 fires burned 249.7 acres (617.2 ha).

Summary of 1982 Forest Fires by Cause and Extent

Cause	No. of Fires	%	Acres (ha)	%
Smoking	99	20	33.5 (82.8)	13
Camp fire	16	3	4.4 (10.9)	2
Incendiary	123	25	118.7 (293.3)	47
Power saw	2	0	0.5 (1.3)	0
Slash (per)	23	5	21.9 (54.0)	9
Slash (N. per)	13	3	6.1 (15.1)	2
Land clear	28	6	6.8 (16.9)	3
Burning debris	61	12	24.4 (60.4)	10
Burn Rt. Way	6	1	2.8 (7.0)	1
Locomotive spark	20	4	2.0 (4.9)	1
Other Engine spark	7	2	0.3 (0.7)	0
Miscellaneous	30	6	4.3 (10.6)	2
Unknown	63	13	24.0 (59.3)	10
Lightning	0	0	0	0
Total	491	100	249.7 (617.2)	100

Aircraft

Aircraft were utilized on 74 fires (15 per cent) during the 1982 season. One aircraft incident occurred in which the department's Jet Ranger (206) was damaged during a water-bucketting operation. Minor injuries occurred to the crew; the machine was a write-off.

Aircraft time (in hours) spent on fire duty is summarized below.

Aircraft	Patrol & Transport Owned	Water Bombing Owned	Total
Cessna 185	30.1	0	30.1
Beaver DHC2	65.8	19.7	85.5
Bell 206B Hughes 500D	175.4	34.5	209.9
Hughes 500D Bell 212	18.5	18.4	36.9
	289.8	72.6	362.4

Equipment Development

As capital funds permitted, 10 units of our ground tanker fleet were given

new cabs and chassis, replacing units dating from the mid-1960's. The conversion was completed in December of 1982.

Provincial staff participated in the Canadian Committee on Forest Fire Control's equipment workshop held at Chalk River in September 1982, at which Mr. Davis, Supervisor, Forest Protection (Fire), made a presentation on ground tanker systems.

Provincial Integrated Mobile Radio System

Although integrated, the system allows each participating agency to use its own "network" with its own radio channels. However, in times of emergency, disaster, or joint operations, the different networks can be patched together.

At the present time some 1,400 mobile units, plus provincial government aircraft, use the system. When the entire system is complete and all users (such as municipal fire departments) are included, more than 3,500 units will enjoy the benefits. The system is controlled 24 hours a day through a central operator. The system is managed by the Department of Lands and Forests, with the operator located at the Provincial Fire Centre, Shubenacadie.

Organizational Changes

A second tracking dog and dogmaster were established in 1982. This unit is utilized in fire investigation, game enforcement, lost person searches, and in general police work with the RCMP.

HUNTER SAFETY EDUCATION

General

The Hunter Safety Education program continued to be very popular with the public. New legislation now in place by way of regulations will make it mandatory in 1983 for all those hunting deer to wear a hunter-orange hat or cap and a hunter-orange coat, vest, or shirt which is visible from all sides.

Firearm Hunter Safety Courses

A total of 9,190 took the course, of which 6,148 were first-time hunters. This was an overall decrease of approximately 1,700 from the 1981 total. The training of some new instructors continued to replace those who left the program for various reasons such as transfers, etc.

Bowhunters Safety Education Program

A total of 224 prospective bowhunters took the bow course, and several new instructors were trained.

Hunting Accidents

Although hunting accidents increased from 12 in 1981 to 14 in 1982, there was a decrease in the number of fatalities, from three in 1981 to one in 1982. See Table XXI, Appendix, for a summary of hunting accidents.

Training Conferences

During January and February 34 staff members attended instructor techniques courses at Antigonish and Kentville. Instructed entirely by department staff, the courses were designed to improve the teaching and assessment skills of those involved with the Hunter Safety program and to assist them with conducting workshops and the like for other programs.

LAW ENFORCEMENT

General

Approximately 110 Operations personnel become involved in all aspects of enforcement. The department is completely responsible for the administration and enforcement of the Lands and Forests Act, Part I—Crown Lands, Part II—Conservation of Forests; the Parks Act and Regulations; the Beaches Preservation and Protection Act and Regulations; and the Forest Improvement Act. However, the department does receive assistance from the RCMP in enforcing those statutes.

The department shares responsibility with the RCMP in the enforcement of the Lands and Forests Act, Part III—Game and the Snow Vehicles Act. The department also assists the Canadian Wildlife Service and the RCMP in the enforcement of the Migratory Birds Convention Act and Regulations.

Part I—Crown Lands

The number of persons charged for theft of products from Crown lands decreased in 1982. It would appear that preventive patrols and advertising had an effect in this area.

Part II—Conservation of Forests

Most charges laid under Part II of the Lands and Forests Act are for causing fire hazards and burning without a permit. Many hours were spent during the fire season investigating fire origins. During 1982 a number of charges were laid against persons for burning without a permit and for permitting fire hazards on their property. Prosecutions increased by about 20 per cent.

Part III—Game and Regulations

Staff assisted by the RCMP and federal fishery officers carried out many hours of enforcement. There was a slight increase in prosecutions overall, and an increase in the prosecutions for "jacking" and related offences. There was a total of 132 in 1981, and this year there were 140 prosecutions. Jacking prosecutions increased from 32 to 68. Heavy fines for jacking range from $1,000 minimum to $2,000 maximum. In several cases the fines imposed were $1,500 and $2,000. There were no vehicles forfeited to the Crown.

Parks Act and Regulations

There were no major problems in the provincial parks during 1982. This could be attributed to the good work of our wardens who have the prime responsibility of patrolling the parks, assisted by the RCMP. Charges laid against persons totalled 127, mostly for disturbances. This was an increase of 25 over 1981.

Beaches Preservation and Protection Act

Our personnel are making extra efforts to prevent removal of beach material and to prevent other damage.

Migratory Birds Convention Act and Regulations

There was a decrease from 41 charges laid in 1981 and 1982. Most of these were handled by the RCMP and the Canadian Wildlife Service, assisted by our staff.

Snow Vehicles Act

On the rare occasions where violations relate to wildlife, the department assists the RCMP in enforcing this statute.

For analysis of charges and offences in all categories, see Table XXII, Appendix.

TABLE I

COMPARATIVE TABLE OF NOVA SCOTIA TIMBER PRODUCTS,
CALENDAR YEARS 1981 AND 1982

PRODUCT	UNIT	1981	1982	INCREASE	DECREASE
Lumber, softwood	Mfbm.	161,040	141,167	—	19,873
Lumber, hardwood	Mfbm.	9,946	8,702	—	1,244
Pulpwood	Cords	1,260,380	879,312	—	381,068
	(m^3 [stacked])	(4 568 316)	(3 187 115)	—	(1 381 201)
Pulp chips, residue	Cords	136,632	94,074	—	42,558
	(m^3 [stacked])	(495,229)	(340,975)	—	(154 254)
Railway ties	Mfbm.	1,639	1,641	2	—
Mine packs	Mfbm.	2,418	1,548	—	870
Pit props	Cords	2,326	3,702	1,376	—
	(m^3 [stacked])	(8 432)	(13 417)	(4 985)	—
Laths	Thousand Pieces	5,697	5,395	—	302
Shingles	Squares	779	961	182	—
Staves & heading	Mfbm.	98	200	102	—
Poles & piling	$Ft.^3$	87,333	55,409	—	31,924
	(m^3)	(2 473)	(1 569)	—	(904)
Boxwood	Mfbm.	3,521	2,950	—	571

TABLE II

FOREST PRODUCTION FROM PROVINCIAL CROWN LAND, CALENDAR YEAR 1982 (COMMON UNITS)

COUNTY	SAWLOGS [1]		PULPWOOD		FUELWOOD		OTHER PRODUCTS*	
	Softwood Mfbm	Hardwood Mfbm	Softwood m^3(stacked)**	Hardwood m^3(stacked)**	Softwood m^3(stacked)**	Hardwood m^3(stacked)**	Softwood m^3	Hardwood m^3
Pictou	—	—	19 036	2 888	—	884	—	—
Antigonish	—	—	25 757	5 057	—	29	—	—
Guysborough	—	—	21 475	8 895	1 595	4 166	—	—
Colchester	1,342.3	10.3	9 743	1 633	—	8 814	—	—
Cumberland	371.9	32.3	3 733	4 521	—	12 346	—	—
Hants	1,120.7	13.9	10 328	5 771	—	8 178	2 303	—
Halifax	2,956.8	122.0	74 140	4 479	—	11 750	—	—
Annapolis	835.3	2.5	5 102	480	—	5 999	—	—
Kings	328.8	27.5	3 705	10 270	—	410	—	—
Queens	1,176.3	54.3	4 763	1 546	—	2 686	54	—
Lunenburg	236.7	13.9	2 331	583	—	6 481	3	—
Digby	737.1	31.8	1 927	—	—	4 663	—	—
Yarmouth	94.0	39.0	2 158	—	—	2 402	—	—
Shelburne	1,046.9	4.3	253	—	617	3 176	3	—
Inverness	—	—	134 693	21 685	—	1 667	—	—
Victoria	—	—	129 748	1 186	—	1 294	3	—
Cape Breton	—	—	9 601	251	—	319	—	—
Richmond	—	—	5 042	—	—	8 113	—	—
TOTAL	10,246.8	351.8	463 445	69 245	2 212	83 377	2 366	—
			127,863 cords	19,104 cords	610 cords	23,003 cords	83,555 ft^3	—

[1] Sawlogs include all products to be sawn

* Products not elsewhere specified converted to m^3 solid wood

** m^3 (stacked) based on 8 ft. (2.44 m) bolts

TABLE III

FOREST PRODUCTION FROM PROVINCIAL CROWN LAND CALENDAR YEAR 1982 (SOLID WOOD)

	SAWLOGS		PULPWOOD		FUELWOOD		OTHER PRODUCTS		TOTAL	
COUNTY	Softwood m^3	Hardwood m^3	Softwood m^3	Hardwood m^3	Softwood m^3	Hardwood m^3	Softwood m^3	Hardwood m^3	Softwood m^3	Hardwood m^3
Pictou	—	—	11 600	1 760	—	539	—	—	11 600	2 299
Antigonish	—	—	15 696	3 082	—	18	—	—	15 696	3 100
Guysborough	—	—	13 086	5 420	972	2 539	—	—	14 058	7 959
Colchester	7 602	58	5 937	995	—	5 371	—	—	13 539	6 424
Cumberland	2 106	183	2 275	2 755	—	7 523	—	—	4 381	10 461
Hants	6 347	79	6 294	3 517	—	4 983	2 303	—	14 944	8 579
Halifax	16 745	691	45 179	2 729	—	7 160	—	—	61 924	10 580
Annapolis	4 731	14	3 054	292	—	3 656	—	—	7 785	3 962
Kings	1 862	156	2 258	6 258	—	250	—	—	4 120	6 664
Queens	6 662	308	2 902	942	—	1 637	54	—	9 618	2 887
Lunenburg	1 341	79	1 420	355	—	3 949	3	—	2 764	4 383
Digby	4 174	180	1 174	—	—	2 842	—	—	5 348	3 022
Yarmouth	532	221	1 315	—	—	1 464	—	—	1 847	1 685
Shelburne	5 929	24	154	—	376	1 935	3	—	6 462	1 959
Inverness	—	—	82 079	13 214	—	1 016	—	—	82 079	14 230
Victoria	—	—	79 065	723	—	789	3	—	79 068	1 512
Cape Breton	—	—	5 851	153	—	194	—	—	5 851	347
Richmond	—	—	3 072	—	—	44 944	—	—	3 072	4 944
TOTAL	58 031	1 993	282 411	42 195	1 348	50 808	2 366	—	344 156	94 997

Conversion factors:

1 Mfbm : 2000 cu.ft. : 5.663 36 m^3 solid wood equivalent

1 cord 8 ft. bolts : 3.624 56 m^3 (stacked) : 2.208 72 m^3 solid wood

1 m^3 (stacked) x 0.609 375 = 1 m^3 solid wood

TABLE IV

FOREST PRODUCTION FROM PROVINCIAL CROWN LAND, CALENDAR YEAR 1982 (ROUNDWOOD LEVEL)

	PROVINCIAL CROWN LAND TO MARCH 31, 1982		PROVINCIAL CROWN FOREST PRODUCTION			PRODUCTION PER UNIT OF AREA	
COUNTY	Acres	Hectares	Softwood m^3	Hardwood m^3	Total m^3	Per Hectare m^3	Per Acre Cu. Ft.
Pictou	102,344	41 417	11 600	2 299	13 899	0.336	4.80
Antigonish	48,173	19 495	15 696	3 100	18 796	0.964	13.78
Guysborough	494,320	200 045	14 058	7 959	22 017	0.110	1.57
Colchester	125,121	50 635	13 539	5 424	19 963	0.394	5.63
Cumberland	152,081	61 545	4 381	10 461	14 842	0.241	3.44
Hants	90,407	36 586	14 944	8 579	23 523	0.643	9.19
Halifax	460,063	186 181	61 924	10 580	72 504	0.389	5.56
Annapolis	110,091	44 552	7 785	3 962	11 747	0.264	3.77
Kings	78,583	31 801	4 120	6 664	10 784	0.339	4.84
Queens	138,181	55 920	9 618	2 887	12 505	0.224	3.20
Lunenburg	91,272	36 937	2 764	4 383	7 147	0.193	2.76
Digby	184,308	74 587	5 348	3 022	8 370	0.112	1.60
Yarmouth	269,132	108 914	1 847	1 685	3 532	0.032	0.46
Shelburne	250,267	101 280	6 462	1 959	8 421	0.083	1.19
Inverness	288,844	116 891	82 079	14 230	96 309	0.824	11.78
Victoria	328,973	133 131	79 068	1 512	80 580	0.605	8.65
Cape Breton	108,340	43 844	5 851	347	6 198	0.141	2.02
Richmond	91,662	37 094	3 072	4 944	8 016	0.216	3.09
TOTAL	3,412,163	1 380 855	344 156	94 997	439 153	0.318	4.54

TABLE V

SPRUCE BUDWORM DEFOLIATION IN NOVA SCOTIA, 1978 TO 1982.

		DEFOLIATION CATEGORIES (hectares x 1000)			
Sector of Province	**Year**	**Light**	**Moderate**	**Variable**	**Severe**
Mainland					
Cumberland	1978	3.2	20.3	0	74.5
Colchester	1979	3.6	17.8	0	77.0
	1980	2.2	66.0	45.8	102.1
	1981	40.8	31.8	0	69.0
	1982	13.6	92.0	0	48.9
Northumberland	1978	10.9	11.7	0	1.2
Coast	1979	31.6	8.9	0	15.8
	1980	13.8	1.2	56.3	7.3
	1981	13.5	11.0	0	1.6
	1982	11.0	28.7	0	0.8
Annapolis	1978	0	0	0	0
Valley	1979	20.7	11.3	0	9.7
	1980	40.1	36.0	0	21.5
	1981	46.9	42.0	0	47.3
	1982	0	4.1	0	0
Cape Breton	1978	0	68.9	203.3	376.7
Island	1979	164.4	129.6	339.4	256.8
	1980	47.4	121.1	456.8	361.3
	1981	31.8	71.4	0	292.9
	1982	12.3	0.4	0	0
Total area of all categories of defoliation	1978	1979	1980	1981	1982
(thousands of acres)	1,905	2,686	3,410	1,730	524
(thousands of hectares)	771	1 087	1 380	700	212

SOURCES: From maps developed from aerial surveys of spruce budworm defoliation.

TABLE VI

SPRUCE BUDWORM EGG-MASS INFESTATION COUNTS PER $10m^2$ IN NOVA SCOTIA, 1974 TO 1982.

	Year								
County	**1974**	**1975**	**1976**	**1977**	**1978**	**1979**	**1980**	**1981**	**1982**
Richmond	125	203	430	649	364	403	423	51	2
Cape Breton	—	496	1608	524	437	349	378	17	7
Inverness	468	552	1319	758	389	316	308	50	151
Victoria	370	676	1832	771	435	647	258	27	50
Cumberland	293	263	191	71	218	307	235	197	622
Colchester	24	20	104	23	165	52	10	22	52
Pictou	—	23	29	125	140	214	116	13	103
Antigonish	204	135	196	182	252	65	136	79	228
Guysborough	0	0	6	78	—	8	0	8	19
Kings	14	12	12	25	73	183	245	86	245
Annapolis	19	16	18	27	121	165	224	72	331
Hants	36	11	6	6	0	19	61	12	5
Digby	12	6	11	20	—	3	86	36	42
Halifax	0	37	0	5	—	0	30	24	21
Lunenburg	0	6	0	6	9	16	10	15	20
Shelburne	0	3	0	12	—	8	28	4	2
Queens	0	3	4	4	0	0	—	6	11
Yarmouth	0	0	16	20	—	28	29	4	4

TABLE VII

FOLIAGE PROTECTION AND LARVAL REDUCTION OF SPRUCE BUDWORM BY BIOCIDE PROGRAM, JUNE 1982

Percent foliage protection of host trees and per cent reduction in survival of larvae of spruce budworm *(Choristoneura fumiferana* (Clemens, 1865)) obtained by aerially applying a microbiological agent *(Bacillus thuringiensis kurstaki* at 20 BIU·ha^{-1}, Nova Scotia, June, 1982.

Treatment Area						Development of treatment dates					
						% Larval Instar				Host Tree	
Name	No.	Cover type[2]	Number of Applications	Area Flown[3] acres (ha)	Abundance of Flowers	Treatment Dates (June)	L3	L4	L5	L6	% Total Shoot Growth	% Buds Flushed
Mainland												
Estonville N	1	rS	1	8,040.3 (3,253.8)	Moderate	27-28	10	60	30	20	17	80
Estonville S	2	rS	1	749.2 (303.2)	Moderate	28	10	40	30	20	17	80
Advocate	3	rS	1	4,276.7 (1,730.5)	High	23	0	40	40	20	14	80
Shulie	4	rS	1	4,466.4 (1,807.5)	High	21-23	10	40	40	10	ND[4]	ND[4]
Wetson	5	rS	1	5,954.2 (2,409.6)	Low	11-12	30	50	20	0	5	0
Five Islands	6	wS(bF)	1	288.4 (116.7)	Low	7	30	70	0	0	40	95
Moose River	8	rS	1	16,248.9 (6,575.7)	Low	25-28					ND[5]	85
Economy	9	rS bF	1	5,750.1 (2,327.0)	Low Low	8-12 8-12	50 50	50 50	0 0	0 0	3 10	0 75
Total mainland				45,774.2 (18,524.2)								
						Instar at treatment - CB						
Cape Breton												
Hume	10	bS	2	169.7 (68.7)	NM[1]		3rd & 4th		4th & 5th		NM	NM
Gaelloch Mtn	11	wS	2	345.0 (139.6)	NM		3rd & 4th		4th & 5th		NM	NM
Muskrat Brook	12	bs	1	55.4 (22.4)	NM		3rd & 4th				NM	NM
Miners Road	13	wS	2	667.7 (270.2)	NM		3rd & 4th		4th & 5th		NM	NM
Kelly Road	14	bs	1	316.5 (128.1)	NM		3rd & 4th				NM	NM
Total Cape Breton				1,554.3 (629.0)								
Total Nova Scotia				47,328.5 (19,153.2)								

Name	No.	Spruce budworm larvae per 45 cm branch tip				% Reduction in Surveyed	Defoliation					
		Pre Treatment L3	Post Treatment Pupae	Survival P/L3 Obs	Exp		% Obs	Exp	% Foliage Saved Abs[2]	Index[3]	Bacterial Colonies per cm[2]	B.t.k. Formulation used
Mainland												
Estonville N	1	31	2.0	6	16	63	21	37	16	43	20.0	Thur - 321.V[4]
Estonville S	2	31	2.0	6	16	63	21	37	16	43	20.0	Thur - 321.V
Advocate	3	37	3.7	10	18	44	28	41	13	32	29.2	Thur - 321.V
Shulie	4	38	2.6	7	19	63	29	42	13	31	19.8	Thur - 321.V
Wilton	5	33	2.7	8	17	53	30	39	9	23	10.8	Thur - 321.V
Five Islands	6	30	4.4	15	15	0	16	86	20	56	4.2	Thur - 16B
Moose River	8	14	0.4	1	7	57	8	81	10	56	26.9	Thur - 321.V
Economy	9	10	0.3	3	5	40	5	11	6	55	25.0	Thur - 321.V
		12	0.9	8	8	0	8	14	6	43	25.0	Thur - 321.V
Total mainland												
Cape Breton												
Hume	10	NM[5]	NM	NM	NM	NM	NM		NM	NM	NM	Dipel 88
Gairloch Mtn	11	NM	NM	NM	NM	NM	NM		NM	NM	NM	Dipel 88
Muskrat Brook	12	NM	NM	NM	NM	NM	NM		NM	NM	NM	Dipel 88
Miners Road	13	NM	NM	NM	NM	NM	NM		NM	NM	NM	Dipel 88
Kelly Road	14	NM	NM	NM	NM	NM	NM		NM	NM	NM	Dipel 88

[1] Cover type based on Quebec system: bF is balsam fir, wS is white spruce, bS is black spruce, and rS is red spruce species complex.
[2] Area determined from navigators report
[3] ND means not determined.
[4] NM means not measured in areas scheduled for multiple applications.
[5] Absolute foliage protection saved is calculated as (expected defoliation – observed defoliation).
[6] Index is a chi square measure and is calculated (expected – observed ÷ (expected).
[7] Thur - 321.V is Thuricide 321.V (1982), Thur - 16B is Thuricide 16B (1980), Dipel 88 (1981).

TABLE VIII

COST OF AERIAL Btk PROGRAM AGAINST SPRUCE BUDWORM, OCTOBER 1, 1981 TO SEPTEMBER 30, 1982

Expenditures of the operational project to suppress larvae of spruce budworm *(Choristoneura fumiferana* [Clemens, 1865]) with the aerial application of a microbiological agent Btk *(Bacillus thuringiensis kurstaki)* (20 BIU.ha^{-1}) in selected areas of Nova Scotia, 1 October 1981 to 30 September, 1982.

Category	COST($)	PERCENTAGE OF TOTAL COST	COST $ Per Acre Flown	COST Per ha Flown
Salaries	129 534.94	17.29	2.71	6.70
Travel	11 552.75	1.54	0.24	0.60
Special services	14 880.39	1.99	0.32	0.78
Supplies & services	530 681.01	70.83	11.01	27.21
Biocide	166 023.95[1]	22.16	3.51	8.67
Aircraft	320 193.19	42.74	6.77	16.72
Lodging	24 070.84[1]	3.21	0.51	1.26
Rentals	15 664.18	2.09	0.33	0.82
Trucking	4 728.85	0.63	0.10	0.25
Equipment	9 554.94	1.27	0.20	0.50
Others	53 025.58	7.08	1.12	2.77
Total	749 229.61	100.00	15.83	39.12

[1] Biocide and lodging for gypsy moth suppressing program included.

TABLE IX

NUMBER OF NOVA SCOTIA WILD FUR EXPORTS, Average Prices (To Trapper) Per Pelt & Estimated Trapper Values: 1979-80 to 1982-83

	1979-80			1980-81			1981-82			1982-83		
Species	Number Exported	Average Price	Total Value	Number Exported	Average Price	Total Value	Number Exported	Average Price	Total Value	Number Exported	Average Price	Total Value
Beaver	4,130	$ 50.00	$ 206,500.	4,071	$ 35.05	$142,689.	3,761	$ 22.46	$ 84,472.	2,663	$ 21.01	$ 55,950.
Muskrat	35,946	6.00	215,676.	47,892	7.03	336,681.	51,941	4.30	223,346.	42,929	4.38	188,029.
Otter	672	70.00	47,040.	592	69.87	41,373.	571	50.89	29,058.	450	51.00	22,950.
Mink	3,861	25.00	96,525.	3,974	25.10	99,747.	4,362	24.49	106,825.	3,622	19.55	70,810.
Lynx	45	200.00	9,000.	0	227.81	—	—	180.50	361.	3	191.25	574.
Bobcat	3,170	140.00	443,800.	1,687	139.98	236,146.	1,722	155.28	267,392.	1,164	95.62	111,302.
Fox	2,908	75.00	218,100.	1,793	71.54	128,271.	2,346	58.47	137,171.	2,320	42.50	98,600.
Raccon	10,948	40.00	437,920.	10,181	41.77	425,260.	12,362	27.36	338,224.	8,511	19.12	162,730.
Weasel	1,071	1.00	1,071.	1,233	0.65	801.	1,148	1.21	1,389.	1,215	3.04	3,694.
Squirrel	4,385	1.00	4,385.	3,314	0.86	2,850.	1,843	0.90	1,659.	8,554	0.75	6,416.
Skunk	76	2.00	152.	65	2.89	188.	23	3.50	81.	19	6.38	121.
Fisher	48	130.00	6,240.	31	126.15	3,911.	45	160.02	7,201.	25	121.12	3,028.
*Black bear	36	65.00	2,340.	39	57.80	2,254.	13	41.00	533.	30	82.88	2,486.
Coyote	2	34.00	68.	17	58.50	994.	39	28.87	1,126.	72	32.30	2,326.
			$1,688,749.			$1,421,155.			$1,198,838.			$729,016.

* Actual bear harvest 1981-82: 546.

TABLE X
NOVA SCOTIA WILD FUR EXPORT* STATISTICS: 1932-33 TO PRESENT

Year	Beaver*	Otter	Muskrat	Mink(wild)	Raccoon	Bobcat	Lynx	Fox	Weasel	Skunk	Squirrel	Bear*
1932-33	No Season	53	13,161	2,386	996	794	16	1,926	8,205	793	107	10
1933-34		78	17,341	2,769	1,423	775	18	1,815	6,135	262	548	7
1934-35		86	38,114	3,233	1,224	703	2	1,838	6,469	471	420	8
1935-36		107	34,019	3,122	1,027	589	8	1,714	9,790	349	10,115	3
1936-37		79	48,135	3,382	1,827	815	5	2,063	15,448	541	25,949	17
1937-38		105	51,349	4,082	1,678	452	15	1,291	9,472	317	12,441	10
1938-39		141	56,898	6,371	1,145	498	30	1,229	7,541	168	46,369	2
1939-40		77	48,860	10,598	1,315	488	62	1,154	7,729	97	9,361	3
1940-41		95	49,505	11,261	1,026	553	101	1,316	3,308	—	13,907	—
1941-42		162	54,694	12,309	1,555	1,119	130	2,665	6,476	271	9,762	132
1942-43		158	49,951	15,553	1,802	862	62	2,574	4,291	90	23,010	132
1943-44	2,789	186	47,733	7,460	1,803	1,193	44	3,659	9,464	143	17,577	161
1944-45	No Season	169	42,237	6,173	1,985	1,011	39	3,408	8,468	120	26,343	278
1945-46	7,320	255	49,653	7,396	2,298	812	11	3,589	9,719	107	95,052	386
1946-47	No Season	264	58,269	10,108	1,719	554	18	2,249	7,632	67	69,594	373
1947-48	No Season	245	50,600	13,002	1,896	389	27	1,232	7,658	39	51,375	409
1948-49	9,570	287	52,052	13,586	1,210	330	34	957	5,852	27	147,970	348
1949-50	No Season	260	39,046	13,552	1,264	315	17	826	6,527	26	24,516	318
1950-51	No Season	174	35,169	2,121	2,194	—	70	1,964	6,922	118	290,228	248
1951-52	7,633	210	41,988	18,015	2,129	336	23	1,632	7,023	13	43,531	219
1952-53	2,479	208	55,214	1,964	2,082	263	5	904	5,864	11	109,482	195
1953-54	3,075	174	57,185	2,253	1,852	248	10	553	5,509	8	82,743	169
1954-55	4,445	212	40,441	2,857	1,253	178	20	443	3,771	3	41,757	156
1955-56	3,113	232	40,756	2,111	1,354	332	51	405	2,245	1	6,706	172
1956-57	5,437	281	36,308	2,867	1,317	142	17	318	3,671	41	13,620	226
1957-58	3,002	258	26,459	2,006	1,266	261	32	657	1,898	364	3,468	164
1958-59	5,323	280	16,706	1,730	527	214	28	269	579	1	1,202	239
1959-60	2,791	185	11,906	1,047	624	151	1	322	395	2	760	236

* Figures for beaver and bear are not true export statistics. Figures for beaver represent the actual harvest tally. Figures for bear are those for bear bountied up to and including 1964; after 1964 they represent calculated bear kill from hunter and trapper reports.

TABLE X
NOVA SCOTIA WILD FUR EXPORT BY SPECIES, 1932-33 TO PRESENT (continued)

Year	Beaver*	Otter	Muskrat	Mink (wild)	Raccoon	Bobcat	Lynx	Fox	Weasel	Skunk	Fisher	Squirrel	Bear*	Coyote
1960-61	7,541	486	22,899	1,996	1,769	555	18	879	2,132	27	—	3,792	174	—
1961-62	3,958	409	17,437	1,864	1,028	377	70	906	986	5	—	3,709	139	—
1962-63	2,744	360	12,339	1,710	1,672	738	79	1,273	1,172	16	—	5,787	155	—
1963-64	2,998	320	21,243	1,990	1,585	657	24	1,109	731	14	—	1,101	162	—
1964-65	5,245	404	24,027	1,777	1,368	617	28	2,733	1,010	235	—	9,522	161	—
1965-66	2,883	591	22,677	2,312	2,276	1,334	97	2,692	2,988	27	—	2,928	256	—
1966-67	4,603	548	20,471	2,256	1,375	1,789	70	2,183	3,445	48	—	11,941	205	—
1967-68	2,488	519	17,565	1,536	1,337	1,567	163	1,492	1,161	8	—	1,758	163	—
1968-69	4,680	492	19,220	1,643	2,706	1,627	87	1,958	1,242	10	—	1,587	108	—
1969-70	3,508	564	29,590	1,908	3,382	1,729	218	2,797	804	34	—	1,035	218	—
1970-71	3,766	457	22,484	1,085	1,746	1,659	37	865	805	8	—	1,623	210	—
1971-72	3,318	665	24,362	1,882	3,659	1,963	47	2,327	215	6	—	303	175	—
1972-73	3,180	610	16,883	1,626	5,346	1,856	30	1,495	403	0	—	1,132	305	—
1973-74	3,757	595	38,117	1,777	6,462	1,320	24	1,924	753	6	—	2,583	113	—
1974-75	2,494	533	37,751	2,294	5,137	1,947	15	1,513	1,096	2	—	6,121	168	—
1975-76	409	202	29,309	2,351	4,715	1,997	0	1,862	1,073	91	—	2,397	249	—
1976-77	2,761	721	28,416	2,339	7,121	2,319	0	2,174	675	6	64	6,278	257	1
1977-78	3,075	594	50,406	3,428	7,355	2,423	39	2,397	548	43	34	2,670	271	1
1978-79	2,186	596	39,781	4,107	9,576	3,245	73	3,343	1,268	142	43	3,529	465	2
1979-80	4,130	672	35,946	3,860	10,946	3,170	45	2,908	1,071	76	48	4,385	831	6
1980-81	4,071	592	47,892	3,974	10,181	1,687	0	1,793	1,233	65	31	3,314	863	25
1981-82	3,761	571	51,941	4,362	12,362	1,722	0	2,346	1,148	23	45	[illegible]	[illegible]	39
1982-83	2,663	450	42,921	3,622	8,511	1,164	0	2,320	1,215	19	25	[illegible]	435	72

* Figures for beaver and bear are not true export statistics. Figures for beaver represent the actual harvest tally. Figures for bear are those [illegible] bountied up to and including 1964; after 1964 they represent calculated bear kill from hunter and trapper reports.

TABLE XI

NUMBER OF SMALL GAME HUNTERS, 1977-82

	1977	1978	1979	1980	1981	1982
Rabbits	31,594	31,343	28,376	23,928	26,061	28,463
Grouse	26,534	26,683	23,526	21,701	21,529	22,328
Wild pheasants	7,217	6,908	5,745	5,742	5,430	5,028
Preserve pheasants	556	515	625	612	517	632
Total pheasants	7,773	7,423	6,370	6,354	5,947	5,660
Hungarian partridge	897	675	860	883	702	878
Woodcock	3,003	2,846	2,267	2,107	1,515	1,829
Snipe	2,535	2,300	1,915	1,767	1,256	1,126
Total upland game	32,344	34,538	31,690	28,801	29,843	29,781
Black ducks	11,929	12,206	10,111	10,027	9,863	10,486
Sea ducks	5,432	4,908	5,001	4,358	4,352	4,435
Other ducks	7,616	7,665	7,176	6,153	5,895	6,722
Geese	5,488	6,440	5,164	5,036	4,631	4,338
Total waterfowl	13,777	14,656	11,904	11,961	11,516	11,965

TABLE XII

SMALL GAME HARVEST, 1977-82

	1977	1978	1979	1980	1981	1982
Rabbits	547,147	641,370	532,184	323,336	379,862	547,566
Grouse	113,509	96,980	77,378	76,274	65,514	83,331
Wild pheasants	9,559	8,938	11,490	13,278	10,822	10,126
Preserve pheasants	2,427	2,172	2,188	2,446	1,773	3,973
Total pheasants	11,986	11,110	13,678	15,724	12,595	14,099
Hungarian partidge	2,262	1,174	1,641	2,004	1,071	1,548
Woodcock	7,568	10,158	5,823	5,537	3,160	3,094
Snipe	7,686	4,740	3,478	6,351	[illegible]	2,673
Total upland game	690,158	765,532	634,182	429,226	464,618	652,311
Black ducks	54,675	57,905	41,694	60,454	41,711	47,327
Sea ducks	40,838	21,712	27,941	28,533	20,608	33,314
Other ducks	35,853	37,600	26,256	34,732	18,403	34,506
Geese	5,433	8,710	10,002	8,524	3,693	5,051
Total waterfowl	136,799	125,927	105,893	132,243	84,415	120,198

TABLE XIII

AVERAGE HARVEST PER SMALL GAME HUNTER, 1977-82

	1977	1978	1979	1980	1981	1982
Rabbits	17.3	20.5	18.8	13.5	14.6	19.2
Grouse	4.3	3.6	3.3	3.5	3.0	3.7
Wild pheasants	1.3	1.3	2.0	2.3	2.0	2.0
Preserve pheasants	4.4	4.2	3.5	4.0	3.4	6.3
Total pheasants	2.0	1.6	2.1	2.5	2.1	2.5
Hungarian partridge	2.5	1.7	1.9	2.3	1.5	1.8
Woodcock	2.5	3.6	2.6	2.6	2.2	1.7
Snipe	3.0	2.1	1.8	3.6	1.8	2.4
Total upland game	21.3	22.2	20.0	14.9	15.6	21.9
Black ducks	4.6	4.7	4.1	6.0	4.2	4.5
Sea ducks	7.5	4.4	5.6	6.5	4.7	7.5
Other ducks	4.7	4.9	3.7	5.6	3.1	5.1
Geese	1.0	1.4	1.9	1.7	0.8	1.2
Total waterfowl	10.0	8.6	8.9	11.0	7.3	10.0

TABLE XIV

KELLY LAKE FISH CULTURE STATION
STOCKING LIST—1982

Yearling Speckled Trout

* *Key to Symbols for Speckled Trout*
D - Domestic Stock
2A - F1 Hyb. F x F1 hybrid M
2C - F1 Hyb. F x Dom. M

HALIFAX COUNTY

Shubenacadie River		
Barrett Lake	(4449 6341)	500 -D
Salmon River		
Partridge River	(4442 6324)	1,000 - 2A
Lake Echo	(4444 6323)	1,500 - D
Lake Echo Pond	(4444 6323)	500 - D
Martin Lake	(4444 6324)	1,000 - D
Otter Lake	(4446 6324)	1,000 - D
Lewis Lake	(4445 6323)	1,000 - D
Eagle Lake	(4445 6327)	1,000 - 2A
Salmon River	(4445 6323)	1,000 - D
Chezzetcook Inlet		
Little Lake	(4445 6316)	1,000 - D
Chezzetcook River		
Bridge End Lake	(4447 6312)	1,000 - 2A
Petpeswick Lake	(4445 6311)	1,000 - 2A
Conrod Lake	(4446 6316)	1,000 - 2A
Chezzetcook Lake	(4447 6314)	1,000 - 2A
Jeddore Harbour		
Abraham Lake	(4447 6259)	1,000 - D
Clam Bay		
Muskrat Lake	(4446 6257)	500 - 2A
Grassy Lake	(4446 6257)	500 - 2A
Ship Harbour River		
Philip Lake	(4456 6250)	1,000 - D
Newcombe Brook		
Bare Rock	(4448 6247)	500 - 2A
Lily Pond Lake	(4448 6247)	500 - 2A
		300 - 2C
		200 - D

Tangier River		
Copper Lake	(4448 6241)	1,000 - D
Long Lake	(4503 6257)	1,000 - D
Third Lake	(4451 6241)	1,000 - D
Granite Lake	(4452 6241)	1,000 - D
West River (Sheet Harbour)		
Big Brook Lake	(4457 6233)	1,000 - D
Coon Lake	(4456 6234)	1,000 - 2C
East River (Sheet Harbour)		
Cruickshank Lake	(4512 6234)	1,000 - D
Fifteen Mile Stream	(4506 6230)	1,000 - D
Halfway Brook		
Lower Lake	(4452 6226)	1,000 - D
Beaver Harbour		
Lily Lake	(4452 6226)	1,000 - 2A
Greenbrook Lake	(4454 6225)	1,000 - 2A
Quoddy Inlet		
Goose Pond	(4455 6220)	1,000 - 2C
Gammon's Lake	(4454 6221)	1,000 - 2C
Moser River		
Kelly Lake	(4503 6220)	1,200 - 2A
		1,200 - 2C
		1,200 - D
Kindervater Lake	(4503 6218)	1,000 - 2C
Bear Lake	(4502 6218)	1,000 - 2C
Round Lake	(4504 6220)	1,000 - 2C
Mill Lake	(4454 6216)	1,000 - 2C
Kelly Lake Stillwater	(4503 6220)	80 - 2C
		22 - D
Jewer Cove (Ecum Secum West)		
Church Lake	(4457 6211)	1,000 - 2A

GUYSBOROUGH COUNTY

Marie Joseph Harbour		
Louse Hill Lake	(4458 6206)	1,000 - 2A
Pye Lake	(4458 6206)	1,000 - 2A

COLCHESTER COUNTY

Stewiacke River		
College Lake	(4512 6248)	1,000 - 2C
Moose Lake	(4522 6301)	1,000 - 2C
Deyarmount Lake	(4518 6301)	1,000 - 2C
Hay Lake	(4518 6301)	1,000 - 2C

HANTS COUNTY		
Nine Mile River		
McGrath Lake	(4500 6342)	1,000 - D
Shubenacadie River		
Shubenacadie Lake	(4455 6336)	1,000 - D
Meander River		
Pigott Lake	(4456 6353)	1,800 - 2A

Total yearling speckled trout - 49,502

YEARLING RAINBOW TROUT

Moser River		
Kelly Lake	(4503 6220)	3,500
Gaspereau River		
Sunken Lake	(4500 6427)	1,750
Bay of Fundy		
Rumsey Lake	(4454 6516)	1,750
Porter's Lake	(4445 6318)	15,087
Dartmouth Lakes (federal)		10,000

Total yearling rainbow trout - 32,087

TABLE XV

FISH AND GAME LICENSE SALES BY COUNTY, 1982-1983

COUNTY	Res. Big Game ($15.00)	Non Res. Big Game ($75.00)		Res. Small Game ($10.00)	Non. Res. Small Game ($35.00)		Senior Citizen	Res. Fishing ($4.00)	Non Res. Fishing ($15.00)	Fur-Bearers ($10.00)
Annapolis	1,986	14		793	8	1	401	2,139	84	250
Antigonish	1,879	23	2	721	9		224	1,863	105	185
Colchester	4,908	80	2	1,610	15	1	666	5,684	174	339
Cumberland	5,034	175	7	1,702	16	1	847	4,203	244	518
Digby	2,884	25	8	1,054	3	1	427	1,396	49	186
Guysborough	1,991	47	4	914	4		313	1,876	206	257
Halifax	16,042	52	4	6,329	10	3	1,278	20,643	279	504
Hants	3,729	20	1	1,209	6		488	3,743	21	309
Kings	3,976	40	3	1,824	13	1	592	5,047	65	289
Lunenburg	4,814	20		1,759	1		718	4,738	66	283
Pictou	5,047	78	1	1,692	7		652	6,798	113	421
Queens	1,922	17		835	4	1	337	1,560	91	184
Shelburne	2,830	29	4	1,561	4	1	359	1,025	52	181
Yarmouth	3,864	50	9	1,791	13	3	573	1,983	110	267
Cape Breton	7,409	26	1	3,582	4	1	776	10,475	158	159
Inverness	2,330	73	8	1,113	1	1	208	2,642	499	172
Richmond	1,244	24	4	739	1		234	875	42	100
Victoria	797	10	1	404	3		109	678	83	90
TOTALS	72,686	803	59	29,632	122	15	9,202	77,368	2,441	4,694

TABLE XVI

LAND RECONVEYED TO THE CROWN, 1982-83

There were 46 reconveyances of land to the Crown located by acreage as follows:

COUNTY	ACRES	ha
Annapolis	0	0
Antigonish	0	0
Cape Breton	272	110
Colchester	680	275
Cumberland	212	86
Digby	0	0
Guysborough	52	21
Halifax	317	128
Hants	3,626	1 467
Inverness	522	211
Kings	0	0
Lunenburg	0	0
Pictou	0	0
Queens	3,493	1 413
Richmond	200	81
Shelburne	341	138
Victoria	458	185
Yarmouth	12	5
TOTAL	10,185	4 122

TABLE XVII

LANDS RECONVEYED TO THE CROWN, BY PURPOSE, 1982-83

PURPOSE	ACRES	ha
Timber reserve	9,246	3 742
Recreation	379	153
Industrial	52	21
Ducks Unlimited	57	23
Right of way	17	7
Protected area	143	58
Park reserve	136	55
Building	28	11
Reserve land	125	51
Radio tower	2	1
TOTAL	10,285	4 122
Expropriation	595	241
Transfer of administration & control	1.5	1

TABLE XVIII

LOCATION OF CROWN LAND, MARCH 31, 1983

COUNTIES	ACRES	ha
Annapolis	110,090	44 552
Antigonish	48,682	19 701
Cape Breton	119,146	48 327
Colchester	125,682	50 862
Cumberland	152,295	61 632
Digby	184,558	74 688
Guysborough	498,871	201 886
Halifax	460,176	186 227
Hants	93,739	37 935
Inverness	302,789	122 535
Kings	78,588	31 803
Lunenburg	91,543	37 046
Pictou	102,236	41 374
Queens	143,090	57 907
Richmond	96,814	39 179
Shelburne	257,804	104 330
Victoria	336,564	136 202
Yarmouth	269,145	108 919
TOTAL	3,471,812	1 404 995

TABLE XIX

FOREST RESOURCE ENHANCEMENT ON PRIVATE LANDS, 1982-83: ASSISTANCE SUMMARY (FRDA)

	50-5,000 acres (20-2 000 ha)		5,000 acres plus (2 000 ha plus)		Pulp & Paper Companies		Total	
Categories	**Unit**	**Assistance**	**Unit**	**Assistance**	**Unit**	**Assistance**	**Unit**	**Assistance**
Management plans	115	$120,991		N/A		N/A	115	$120,991
Access roads (built & under construction)	58 miles (93 km)	$136,253		N/A		N/A	58 miles (93 km)	$136,253
Bridges	2	$398		N/A		N/A	2	$398
Boundary lines	130 miles (209 km)	$57,547		N/A		N/A	130 miles (209 km)	$57,547
Fire ponds	18	$3,600		N/A		N/A	18	$3,600
Silviculture	3090 acres (1 251 ha)	$356,757	74 acres (30 ha)	$3,898	17,189 acres (6 959 ha)	$714,258	20,353 acres (8 240 ha)	$1,074,913

Group ventures are not included in the above.

TABLE XX
GROUP FOREST MANAGEMENT ON PRIVATE LAND, 1982/83
PROGRESS REPORT SUMMARY

Group Venture Co. or Co-op	Operating Costs ($) GDA	FRDA	TOTAL	Total No. of Mgmt. Plans	Total Area under Mgmt. acres (ha)	Total Merch. Vol. under Mgmt. 000 ft.³ (000m³)	Road Construction FRDA miles (km)	Silviculture GDA and FRDA acres (ha)	Volume of Wood Sold ft.³ (m³)	Mgmt. Fee Contribution to Operating ($)
West Pictou	22,106	47,584	69,690	120	12,982 (5 254)	25,000 (708)	6.5 (10.5)	210.4 (85.1)	98,840 (2 799)	1,674
North Nova	23,731	31,428	55,159	69	19,392 (7 848)	23,600 (668)	4.0 (6.4)	160.5 (65.0)	88,250 (2 499)	2,788
Baddeck	24,888	35,388	60,276	89	13,104 (5 303)	16,630 (471)	nil (nil)	32.2 (13.0)	195,100 (5 525)	4,959
LaForet	22,039	35,084	57,123	95	5,540 (2 242)	6,980 (198)	2.6 (4.2)	63.4 (25.7)	116,100 (3 288)	2,080
North Mountain	22,036	28,657	50,693	66	5,668 (2 294)	5,590 (158)	nil (nil)	302.4 (122.3)	115,200 (3 262)	1,642
Sissiboo	21,036	30,101	51,137	81	11,760 (4 759)	9,880 (280)	2.0 (3.2)	184.8 (74.8)	51,190 (1 449)	1,109
Conform	22,286	45,814	68,100	105	18,708 (7 572)	31,690 (897)	22.7 (36.5)	220.0 (89.0)	309,500 (8 764)	5,295
Athol	21,744	33,757	55,501	35	12,200 (4 937)	13,530 (383)	2.6 (4.2)	190.0 (76.9)	74,300 (2 104)	2,047
TOTALS	$179,866	$287,812	$467,678	660	99,354 (40 207)	132,900 (3 763)	40.4 (65.0)	1,363.7 (551.8)	1,048,480 (29 690)	$21,594
1981-82	—	—	$460,450	593	91,241 (36 924)	114,880 (3 253)	94 (141)	3,803 (1 539)	2,041,600 (57 812)	$36,775
1980-81	—	—	$411,187	468	71,714 (29 022)	73,590 (2 084)	96 (154)	2,583 (1 045)	1,200,900 (34 006)	$19,140
1979-80	—	—	$440,867	307	50,330 (20 368)	49,150 (1 392)	76 (122)	1,523 (616)	501,780 (14 209)	$10,167

TABLE XXI
SUMMARY OF HUNTING ACCIDENTS
AND NON-HUNTING ACCIDENTS AND RELATED STATISTICS, 1982

County	Injury Hunting Accident	Injury Non-Hunting Accident	Fatality	Total By County
Annapolis	1			1
Antigonish	1			1
Cape Breton	1			1
Cumberland				—
Colchester	2			2
Digby	1			1
Guysborough	3			3
Halifax	1	1		2
Hants				—
Inverness				—
Kings				—
Lunenburg				—
Pictou	1			1
Queens			1	1
Richmond				—
Shelburne				—
Victoria	1			1
Yarmouth				—
TOTAL	12	1	1	14

HUNTER SAFETY COURSES

First time firearm hunters	6,148	
Other firearm hunters	3,042	
Bowhunters	224	
TOTAL		9,414
Failures: Firearm	687	
Bowhunter	—	
TOTAL		687

COURSE GRADUATES INVOLVED IN ACCIDENTS

Firearm Course	4
Bowhunter Course	—
TOTAL	

GAME BEING HUNTED				TYPE OF WEAPON INVOLVED			
Moose	—	Furbearers	—	Shotgun	7	Muzzle loader	—
Deer	3	Bear	—	Rifle	4	Bow	—
Rabbits	7	Unknown	—	22 Cal.	3		
Birds	3	Non-Hunting	1				

CAUSES OF ACCIDENTS

Shooter stumbled and fell	2	Victim out of sight of shooter	4
Victim mistaken for game	3	Victim moved in line of fire	—
Trigger caught on object	—	Weapon fell from insecure place	—
Unintentional discharge	5	Victim covered by shooter	
Horseplay with firearm	—	swinging on game	—
Clubbing cover or game	—	Crossing fence or obstacle	
Intentional discharge	—	with loaded weapon	—
Unloading weapon	—	Removing weapon or	
Defective weapon	—	placing in vehicle	—
Others	—	Riding in vehicle	
		with loaded firearm	—

COLOUR OF CLOTHING WORN BY VICTIM

White	—	Blue	—	Yellow	—
Red	2	Dark	1	Orange Fatal	1
Green	3	Other	5	Orange Injury	2

TIME OF DAY ACCIDENT OCCURRED

6:30 - 8:00 a.m.	1	12:00 - 4:00 p.m.	3
8:00 - 10:00 a.m.	2	4:00 - 5:00 p.m.	4
10:00 - 12 Noon	1	5:00 - Dusk	3

COVER TYPE		VISIBILITY	
Dense	4	Clear	6
Light	6	Poor	1
Open	3	Overcast	4
Unknown	—	Dark	2
		Unknown	—

VISION		SELF-INFLICTED ACC'D.	
Wears glasses	1	Fatal	—
Color blind	—	Injury	4
Unknown	—	TOTAL	4

AGE CLASS OF ACCIDENTS

	Shooter	Victim		Shooter	Victim
Unknown	—	—	31 - 35	2	—
10 - 15	2	1	36 - 40	2	—
16 - 20	1	3	41 - 45	—	—
21 - 25	1	1	46 - 50	1	—
26 - 30	3	2	51 -	2	3

CHARGES LAID AS RESULT OF ACCIDENTS

Lands and Forests Act	5
Criminal Code	1
# Liquor Involved	—

MUZZLE TO WOUND DISTANCE (YARDS)

0 - 10	7
11 - 50	5
51 - 100	2
Over 100	—
Unknown	—

HUNTING EXPERIENCE OF SHOOTER

1 Year	2	4 Years	—	Over 5	1
2 Years	—	5 Years	1	Over 10	7
3 Years	1	Unknown	2		

TABLE XXII

SUMMARY OF OFFENCES & CONVICTIONS BY STATUE & COUNTY, JANUARY-DECEMBER 31, 1982

A — Offences known or reported; B — Number of persons charged; C — Warnings issued

DISTRICT		L&F ACT PART I	L&F ACT PART II	L&F ACT PART III	PARKS ACT	BEACHES P&P ACT	SNOW VEHICLES ACT	MBC ACT	TOTALS
	A	—	—	82	—	—	1	—	83
Annapolis	B	—	—	26	—	—	—	—	26
	C	—	—	10	—	—	—	—	10
	A	—	—	88	—	4	—	3	95
Antigonish	B	—	—	16	—	—	—	—	16
	C	—	—	5	—	4	—	—	9
	A	6	52	364	14	9	—	40	485
C. B./Sydney	B	1	5	19	10	—	—	—	35
	C	—	4	34	4	—	—	—	42
	A	3	5	150	—	—	—	4	162
Colchester	B	—	1	37	—	—	—	—	38
	C	1	12	30	—	—	—	—	43
	A	4	—	88	—	—	—	—	92
Cumberland East	B	1	—	19	—	—	—	—	20
	C	—	—	—	—	—	—	—	—
	A	—	—	70	2	5	—	—	77
Cumberland West	B	—	—	16	—	—	—	—	16
	C	—	—	2	—	—	—	1	3
	A	1	—	149	4	2	—	1	157
Digby	B	—	—	17	—	1	—	—	18
	C	—	—	7	—	—	—	—	7
	A	—	10	43	—	2	—	6	61
Guysborough	B	—	—	3	—	—	—	—	3
	C	—	2	1	—	—	—	—	3
	A	10	5	432	84	7	—	46	584
Halifax East	B	1	—	71	34	—	—	8	114
	C	—	3	34	19	3	—	11	70
	A	4	22	122	82	5	—	28	263
Halifax West	B	—	—	34	33	—	—	4	71
	C	2	3	32	19	2	—	2	60
	A	1	10	127	17	—	—	4	159
Hants	B	1	1	71	6	—	—	1	80
	C	—	8	114	15	—	—	—	137
	A	—	8	138	—	—	—	—	146
Inverness	B	—	—	26	—	—	—	—	26
	C	—	8	48	—	—	—	—	56
	A	1	7	212	2	2	—	2	226
Kings	B	—	4	41	—	—	—	1	46
	C	—	3	96	—	—	—	—	99
	A	—	26	211	23	4	3	8	275
Lunenburg	B	—	4	55	—	—	2	—	61
	C	—	15	85	8	1	1	—	110

TABLE XXII (continued)

A — Offences known or reported; B — Number of persons charged; C — Warnings issued

DISTRICT		LAF ACT PART I	LAF ACT PART II	LAF ACT PART III	PARKS ACT	BEACHES P&P ACT	SNOW VEHICLES ACT	MBC ACT	TOTALS
	A	1	7	289	53	2	—	3	355
Pictou	B	—	3	43	44	—	—	—	90
	C	—	2	15	7	2	—	2	28
	A	1	11	66	1	—	—	1	80
Queens	B	—	—	20	—	—	—	—	20
	C	—	8	7	—	—	—	—	15
	A	9	12	51	—	2	—	7	81
Richmond	B	2	—	10	—	—	—	—	12
	C	6	12	4	—	—	—	—	22
	A	1	6	51	9	1	—	9	77
Shelburne	B	—	—	11	—	—	—	4	15
	C	—	—	7	—	1	—	—	8
	A	—	1	144	—	—	—	4	149
St. Marys	B	—	1	24	—	—	—	1	26
	C	—	—	30	—	—	—	5	35
	A	8	2	103	3	—	—	7	123
Victoria	B	—	—	12	—	—	—	—	12
	C	—	—	39	1	—	—	1	41
	A	4	17	140	4	3	—	13	181
Yarmouth	B	—	—	35	—	—	—	7	42
	C	4	2	14	4	2	—	1	27
	A	54	201	3,120	298	48	4	186	3,911
TOTAL	B	61	19	606	127	1	2	26	787
	C	13	82	614	77	15	1	23	825

# Prosecutions - Jacking	68
# Prosecutions - Uncased guns	56
# Prosecutions - Shining lights	16
TOTAL	140